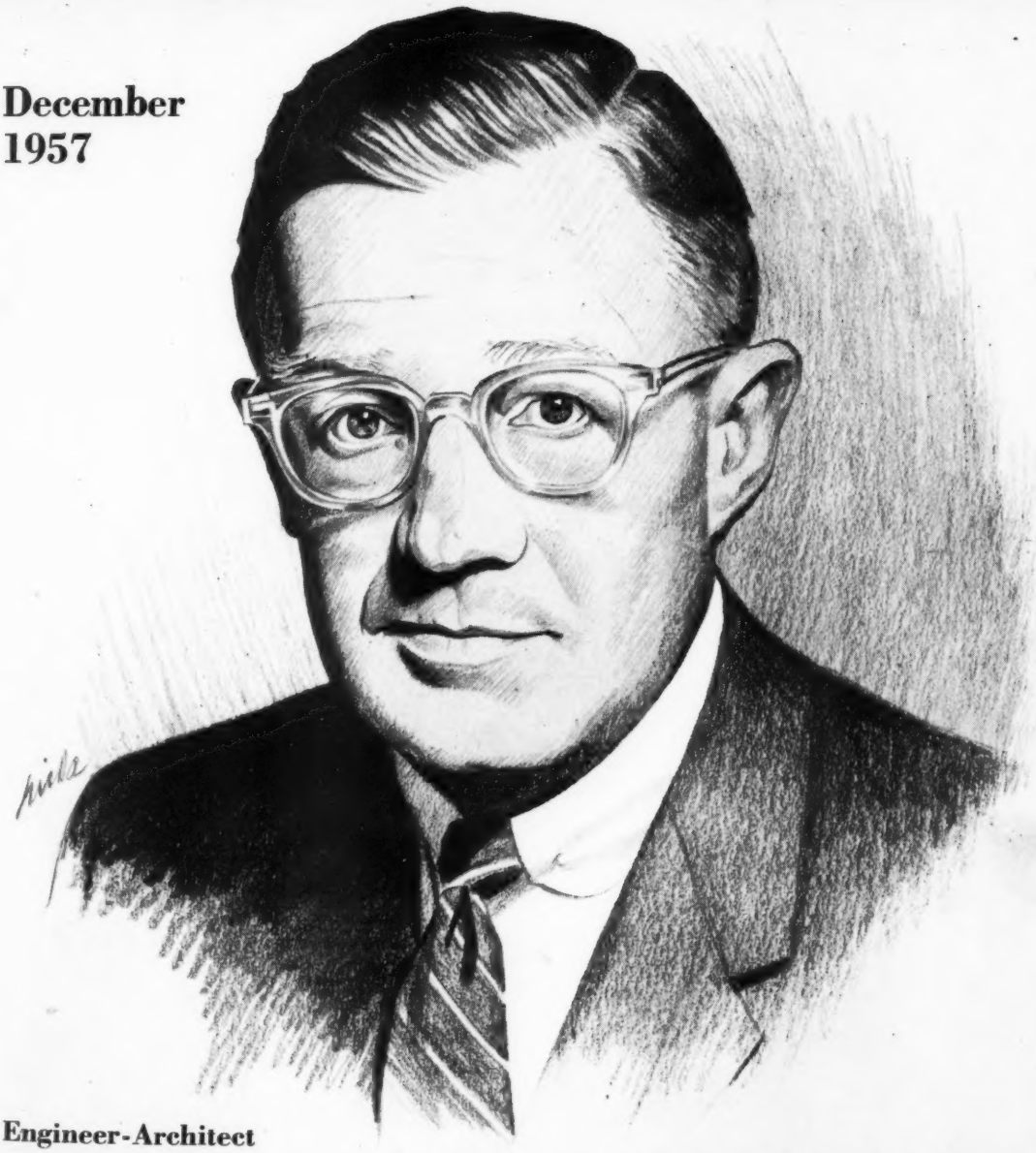
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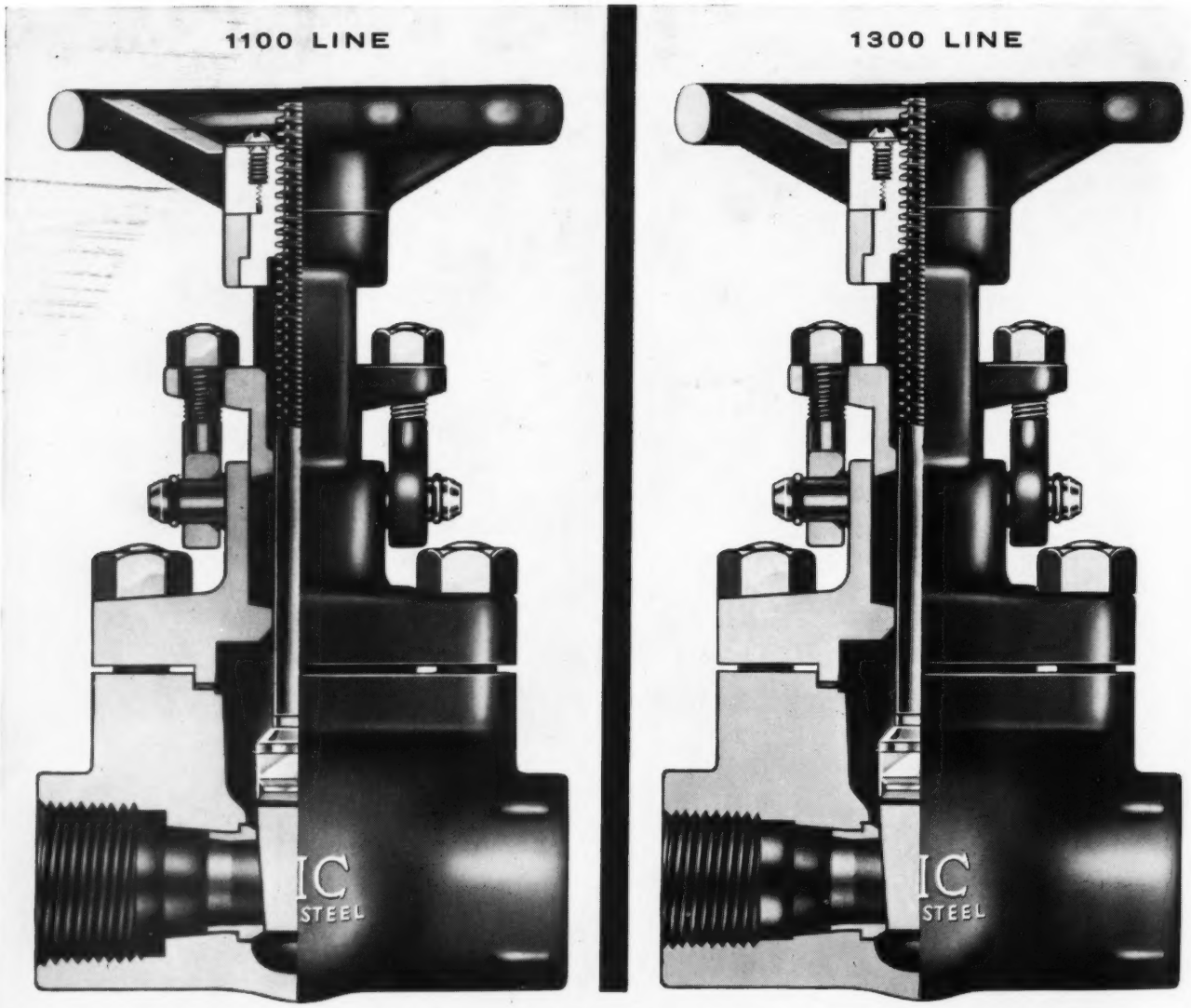
December 1957



Engineer-Architect

FRANK L. WHITNEY, vice president in charge of engineering at Walter Kidde Constructors, Inc., New York and Houston, thinks the future influence of the engineer and architect on industrial facilities will depend on the extent to which they understand, and accept,

Continued on page 8



New, OIC bolted bonnet, 600 lb. forged steel gate valve lines, ½" to 2" with HCH, all purpose trim.

2 new rugged OIC forged steel lines



Both feature the modern and rugged bolted bonnet joint, which simplifies and lowers the cost of maintenance.

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December, 1957 • VOLUME IX • NUMBER XII

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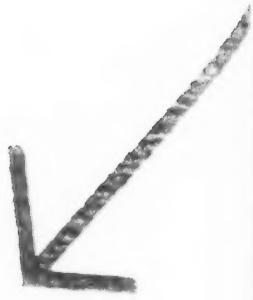
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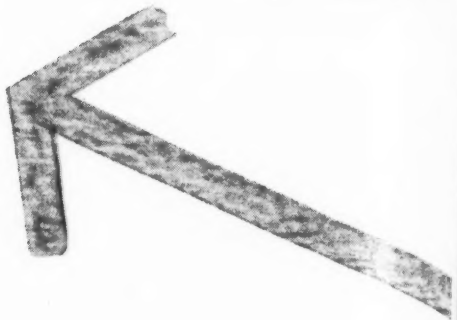


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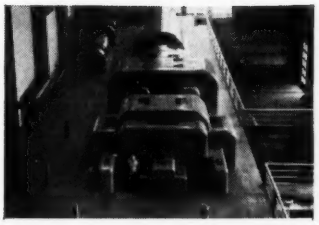


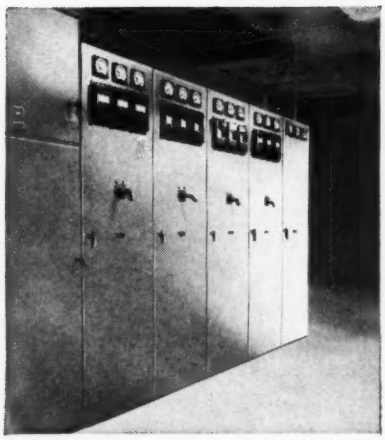
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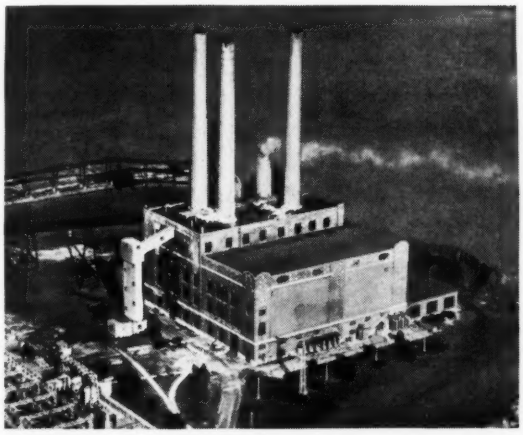
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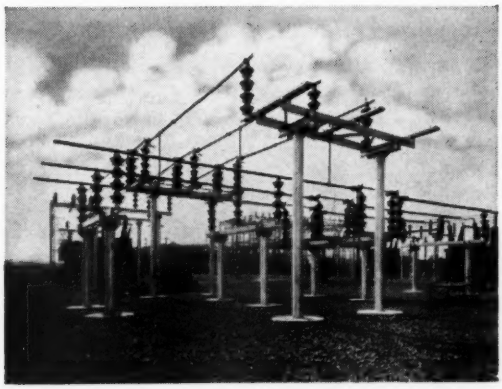

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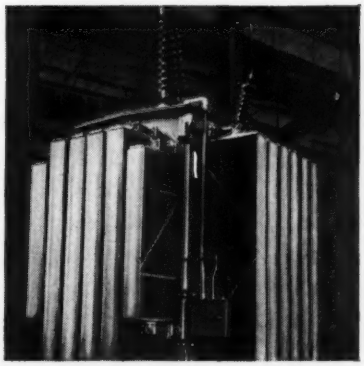

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Frank L. Whitney

—*Starts on front cover*

new trends in industrial technology and thinking.

"An industrial building should not be designed merely to house a process — it should be a part of the process," Whitney fervently believes.

Projects engineered under his supervision at Walter Kidde Constructors reflect this belief. One of the most recent is the $10 million Johnson & Johnson Eastern surgical dressings plant, at North Brunswick, N. J. A series of long, low buildings extending for ½ mile on a 300-acre site, the plant is, in Whitney's words, "half-building, half-machine."

When Kidde was called in on the project, Johnson & Johnson had several small plants, each with its little community of workers, each highly autonomous, and all possessed of highly attractive buildings. The only trouble was that the buildings were bursting at the seams.

Johnson & Johnson wanted to consolidate its operations at one site and provide plenty of room for future expansion. At the same time it wanted to continue the autonomy of each manufacturing operation as before. Not unnaturally, the company's preliminary thinking centered on one large building.

Under Whitney's direction, the Kidde planning team evolved the final multiplant design. The breakthrough came as a result of considering the plant as a series of processes on a limitless site without walls. A continuous conveyor, called for by J&J engineers as the plant's prime mover of finished goods, was routed through the series of processes. Finally, the walls went up naturally, following the conveyor route. The result:

¶ Future expansion was facilitated, without slowing down unrelated production areas.

¶ Autonomy of each operation was preserved.

¶ Parallel rail spurs, storage space, and production lines in each building minimized material handling.

An added chance for architectural expression was provided, with some relief in size and height, some chance for color, and scope for landscaping.

Expansion Made Easy

"And fifty years ago," Whitney says, "that would be the end of the story. Once a plant was built, it took on a sort of institutional quality. Management regarded it as the ancestral corporate home, and it resisted change for years."

Whitney expects the Johnson & Johnson plant to change — and soon. "It was designed that way," he explains. "As production increases or whole new manufacturing operations are added, some of the walls will disappear. The conveyor system will be lengthened, new boilers and transformers will be added — space has been provided for them."

What, Whitney was asked, about the beauty of a functional plant? Does it look like a plant? And, perhaps even more important, what about the cost?

"Let me take that last question first," Whitney answered. "In any industrial building project, cost is a primary consideration. Sometimes an ideal solution has to be thrown away or modified because it is too expensive. On the other hand, it is surprising how often the cost of the compromise equals the cost of the best solution. It's a question of persevering until the best answer can be found. At Johnson & Johnson, for instance, the cost of the final design equalled the cost of one big building. There were more exterior walls, of course, but a big building would have required fire walls between each manufacturing operation.

"As to whether modern industrial plants look like plants, it depends on your definition. If you mean the ancestral corporate home, unchanging and unchangeable, no. They are lighter, more colorful, usually air-conditioned, and more functional. They often do not look like any other plant you have ever seen — nor should they."

Every Plant is Different

Each industrial design brings its own set of problems, Whitney explained. An architect does not have to duplicate the currently successful concept of an industrial building. Unless his design expresses creative exploration of his particular problem, the result cannot, in Whitney's opinion, be beautiful.

How does an architect get interested in industrial work? The answer for Whitney began shortly after his graduation, in 1937, from Western Reserve University's school of architecture. He studied engineering on his own time while doing industrial design work, which then was considered for the most part the province of the engineer with very little attention paid to architectural values. (Notable early exceptions were, in Whitney's opinion, Albert Kahn and Giffels & Vallet, both of whom looked upon engineering and architecture as a part of the whole.)

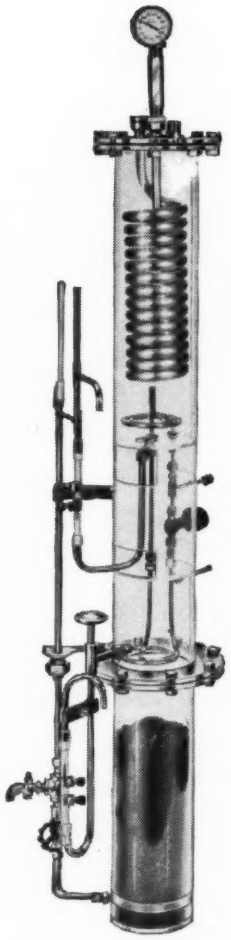
His first chance to design a significant new industrial building group came in 1947, when as a project engineer with H. K. Ferguson Company, Cleveland, he was assigned to Corn Products Refining Company's new plant, at Corpus Christi.

One of the first problems he had to solve was: what materials will hold up in the sulfuric acid atmosphere of a steep house (where corn is processed chemically)? Whitney's answer, "none."

In the steep house, acid fumes used to eat out window sash; it even ate out the settings of glass block, not to mention its effect on workers' comfort.

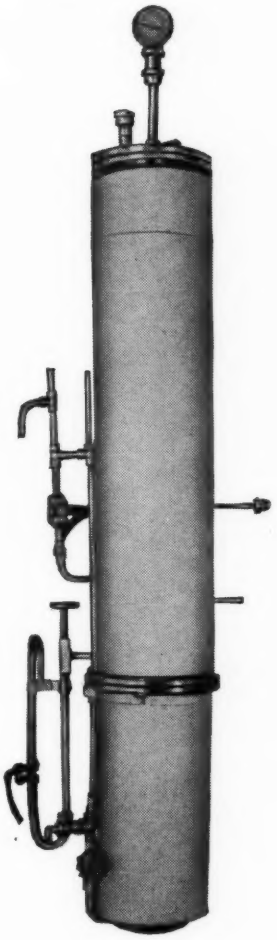
Once again, the solution came from thinking of the buildings as a theoretical layout of processes on a limitless site without walls. This time, however, the walls were never added. Of 16 buildings on the project, only warehouses were designed with walls.

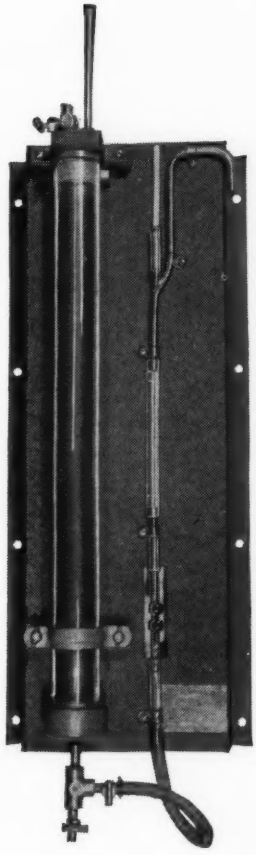
It took more than 250 perspective drawings and the work of a dozen men before everyone was sat-



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Model SC-19 Steam Analyzer ready for installation.





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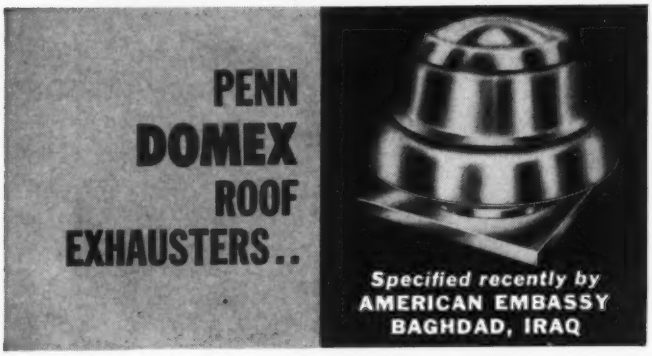
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isfied. "And I had the full support of the client — a necessity for the success of any project."

Whitney had found that only two or three men worked in the steep house. And since buildings are primarily for men, not machines, his solution was to concentrate on the industrial processes. He estimates that the work of his group saved the client $750,000, "although you cannot compare what is with what might have been."

Ten years later, Whitney reiterates his belief that people, not production equipment, need walls. "We do not discount the importance of people," he explained. "More money is spent for their welfare than ever before by industry. Their particular areas of influence are being designed for comfort and efficiency. But the need to provide for people in industrial design has dwindled historically. The first New England factories, for example, were built as enclosures for the people who comprised the assembly lines. There may even come a time when the factory designer will face a difficult decision — whether to house the machine or the man."

The Corn Products project was the only industrial building group included by the Museum of Modern Art in its "Postwar Architecture: USA" exhibit. More important in Whitney's view is the fact that the "process without buildings" has a number of important practical advantages.

"Take the steep house for example. Some day, if an entirely new and different process is discovered, all the firm will have to do is install the required machinery. There is no building to adapt. If the process were inside a conventional building, the owner would have to tear out the tanks, fill in the floors, and compromise the machinery arrangement to a building which was built for another process."

Another advantage is that the building materials cannot corrode. And the open arrangement allows full ventilation of the machinery. Maintenance? Less building means less gadgets, and the wide open spaces take care of much of the maintenance. There are no ledges and crevices to collect dust.

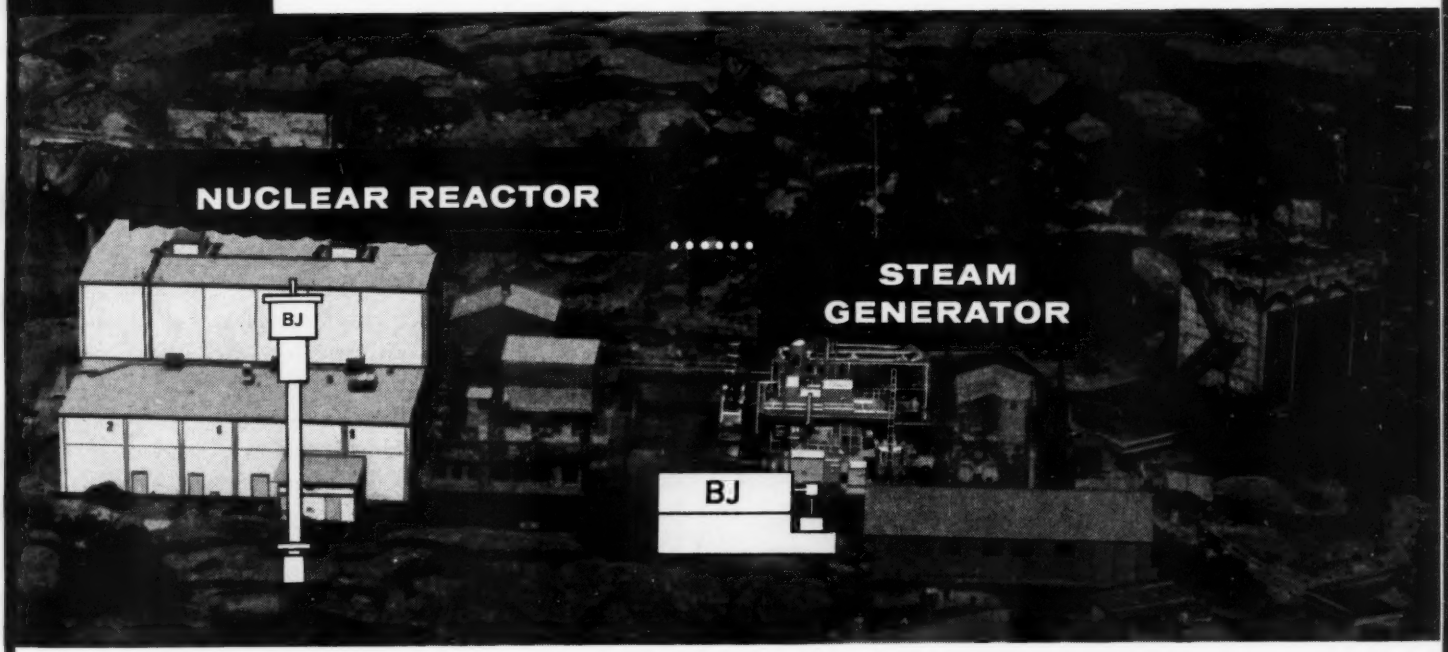
Complementary Professions

Now both an architect and engineer, Whitney feels that the two professions are complementary. "Architecture, supplemented with engineering, is a particularly good combination when dealing with products, where the emphasis is on basic design. For designing process projects, the ideal combination is engineering supplemented with architectural studies. For that reason, Kidde offers an integrated engineering service," he said.

At Walter Kidde Constructors, Whitney has found interests similar to his own. He joined the firm in 1953 as chief engineer and has since been elected vice president in charge of engineering and member of the board of directors. Engineering and architecture are recognized, Whitney says, as func-

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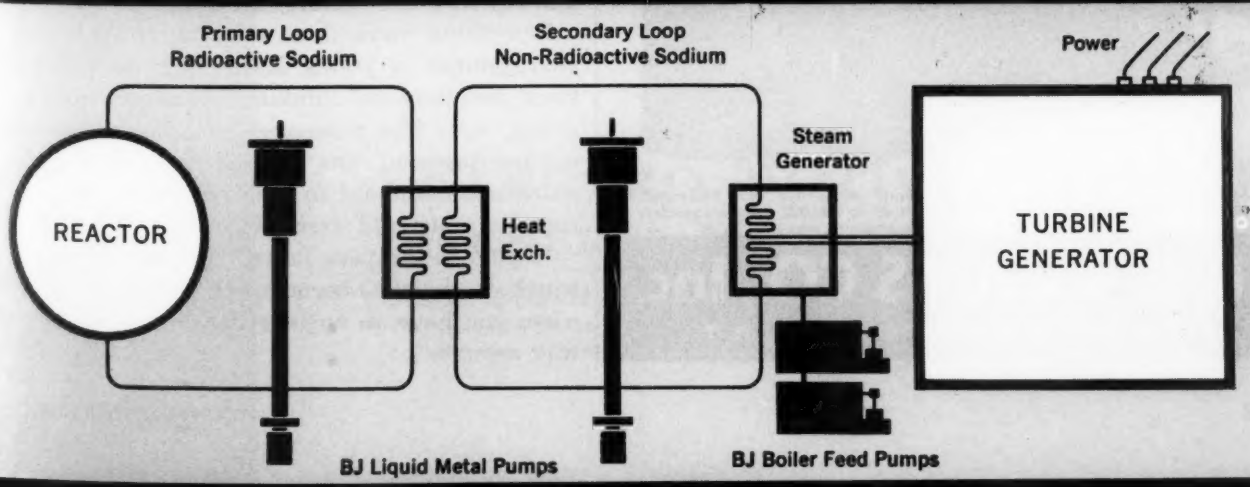
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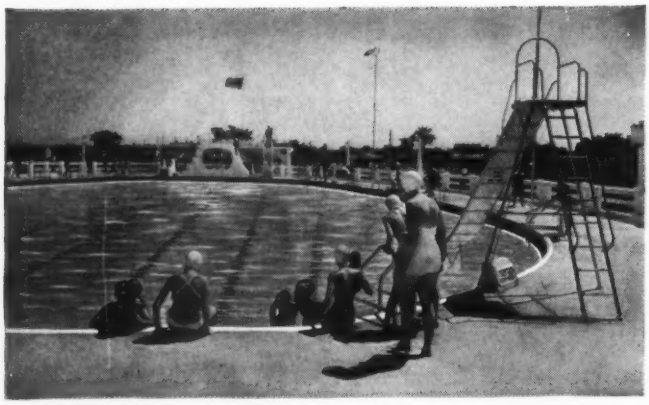
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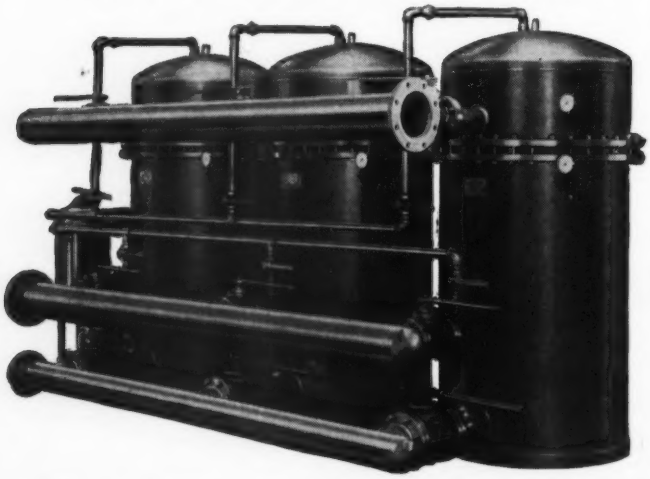
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tions which must have a "complete marriage" if a project is to be a success. The firm emphasizes the advantages of a single responsibility for engineering.

Firm History

Founded in 1900 by Walter Kidde, a young graduate engineer from Stevens Institute of Technology, the firm now has offices in New York, Houston, and Baton Rouge, and administers a separate company, Walter Kidde Engineers Southwest, whose work is primarily with the process industries.

In addition, the firm is joint owner with Walter Kidde & Company, Inc., Belleville, N. J., of Walter Kidde Nuclear Laboratories, Inc., Garden City, Long Island. The nuclear laboratory specializes in studies and designs for atomic reactors and components, a field that Whitney feels will be a particularly interesting source of design and engineering innovations in the next few years.

Among the recent Kidde projects that Whitney's engineering group has designed are the Parker-Kalon production facilities, at Delawanna, N. J.; three production plants for Western Electric; the Warner-Chilcott laboratories, at Morris Plains, N. J.; laboratories for Shell Chemical Corporation, at Union, N. J.; and, of course, Johnson & Johnson.

Asked about the form that future industrial buildings may take, Whitney laid stress on the influence of automation and new materials. Automation, he thinks, will lead to changes. Since machines do not require stairs, for instance, automation may even bring back vertical structures, reversing the horizontal trend. Among new materials coming into favor he lists plastics, panels, and glazed tile.

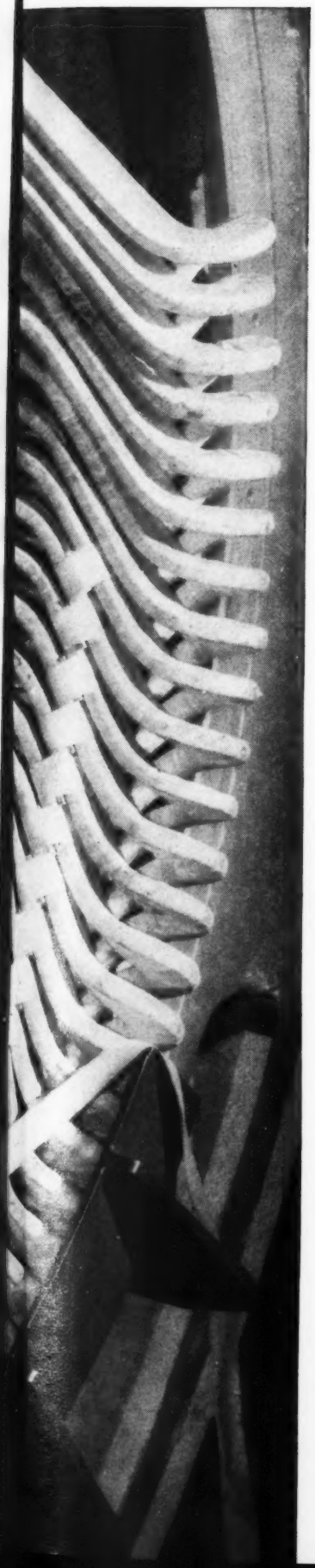
Born in Conneaut, Ohio, Whitney now lives in Westfield, N. J., with his wife and three children. One of his hobbies is art. In fact, he attributes his interest in architecture and then engineering to an early attraction to art. "I had a desire to draw, and some talent in that direction," he says, "but I lack the imagination of an artist." His associates may disagree with this appraisal.

Whitney has found that many of his fellow engineers at Kidde are also spare time artists. Each year the company holds an informal art show, whose entrants include everyone from top management to draftsmen and secretaries, that produces excellent and varied work. Whitney specializes in water colors.

Something more than a hobby is Whitney's encouragement of young Kidde engineers to understand architectural thinking. At present one of his group, who has a master's degree in mechanical engineering and has studied architecture in his spare time, is about to take his examination to become a registered architect.

"I plan to compare notes," Whitney said, "to see which is easier — becoming a registered architect when you have an engineering degree, or the other way around." ▲▲

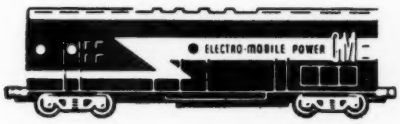
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Engineering Societies

Sir:

I am returning ... your [circulation] questionnaire [which] does not provide space for very much information so reference is made to your paragraph 4, "Membership in engineering societies." At this time I do not belong to any of the engineering societies mentioned in your questionnaire and I think it is worthwhile to mention why. The reason that I am not a member of these societies is that as far as I am personally concerned they are some of the most useless institutions that we have in America. In fact, I consider them definitely harmful to the true interest of an engineer, because they are dominated by the large corporations who manage to get their supervisory employees in as members and any effort of the working engineer to improve his economic status is suppressed and diverted by the chief engineers, assistant chief engineers, and assistant assistant chief engineers, who belong to these societies. Indeed, not only are engineers diverted, but on many occasions when efforts have been made to start some movement to better their working conditions or their pay or the economic standing of the engineer in society, these people have gone to great lengths to break up such movements and to oppose them.

In addition to the above considerations, the meager amount of information that one can gain from the meetings of these societies is pitiful. One can learn more from looking through an engineering magazine and reading advertisements in one month than he could in attending the meetings of such societies for ten years. I hope this explains the attitude of myself and most of my associates to that sort of organization.

William E. Denison, President
Tammen and Denison, Inc.
Chicago, Ill.

For Better Relations

Sir:

I am a regular recipient of your magazine at place of employment, and really enjoy it.

I would like to receive several copies of reprint "How to Improve Engineer-Manufacturer Relations" (October 1957) for possible distribution.

My position as Materials Engineer calls for me to meet all salesmen and sales engineers who call on the company, with no direct contact. Then after learning of their interest I either interview them, or direct them to the parties they should see.

We issue a regular notice to department heads of literature received, and file this literature in a central file, cross-indexed for subject, supplier, and trade name. Additional copies are obtained if so desired for various departments.

Where information is needed on a particular item it is directed to me for processing. In this way we maintain a single contact between the company and manufacturers or other contacts. Information obtained is entered on a report form for future reference to avoid repeated calls to a company for the same information. No attempt is made to do away with personal contacts for any member of the company but rather to initiate or supplement them.

G. W. Kingston
Materials Engineer
Parsons, Brinckerhoff, Hall & Macdonald
New York, N. Y.

Sir:

As a Sales Engineer in frequent contact with consulting engineers, I was very interested in your October 1957 issue, particularly the article titled "How to Improve Engineer-Manufacturer Relations." This is a very appropriate topic and should be constructively expanded with the manufacturers' comments.

The "Better Relations Check List for Manufacturers" is particularly good and certainly "free engineering" offers by anyone may lead to trouble. It should be pointed out, however, that product designing is a necessity for the manufacturer and it is project designing that should be left to the consulting engineer. When indulging in product design, the consultant places himself in the position of a competitor. The unfortunate result is that the manufacturer is very hesitant to recommend him, and the exchange

Speedline® Fittings Cut Process Piping Costs

DESIGN FEATURES

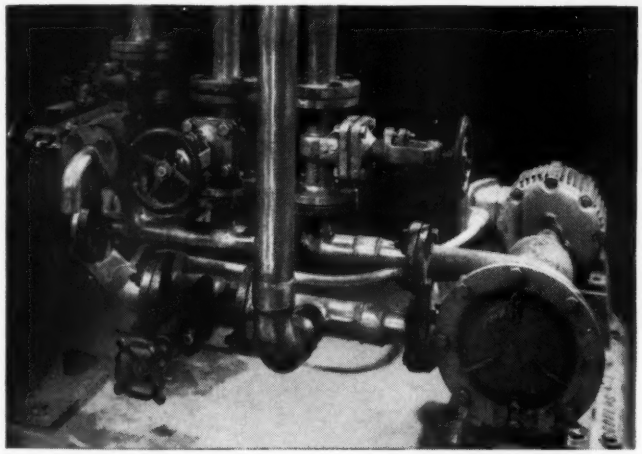
ALSO SOLVE CORROSION

AND LEAKAGE PROBLEMS

at

CHAPMAN CHEMICAL COMPANY





Process lines at Chapman Chemical Company, Memphis, Tennessee, manufacturers of wood preservatives, agricultural and industrial chemicals.

"Easiest, most economical means to assemble leak-proof, stainless steel process lines", says D. B. Smith, chief engineer at Chapman Chemical Company. Thanks to the "tangential" feature of Speedline fittings—which permitted on-the-job selection of joints with or without welding—labor time and costs were cut to a minimum. Corrosion and leakage problems common to conventional fittings were also eliminated on stainless steel reactor lines used in the manufacture of ester resins. Speedline features offered other important advantages throughout the installation.

- System provided positive corrosion *and* heat resistance to handle low concentration of sulphuric acid . . . other solutions at temperatures up to 500° F!
- Simplified construction of multi-purpose system manifold, because exclusive "tangential" feature—an extra straight section on *every* end of *every* Speedline fitting—permitted flanging *without* welding!
- Aligning connectors speeded installation and insured leak-proof joints, where welding was required.
- System allows for easy modification of existing lines to meet future process piping requirements.

Only Speedline corrosion-resistant fittings, designed especially for use with economical, light wall Schedules 5 and 10 stainless pipe, provide these time and cost saving advantages not possible with conventional fittings.

How the design features of Speedline fittings can help solve *your* process piping problems is described in a fully illustrated data book available on request. Write today for a copy of Speedline Catalog at no obligation . . . or contact the Speedline distributor nearest you.



70-

Speedline®

SPEEDLINE IS A REG.T.M. OF HORACE T. POTTS COMPANY

STAINLESS STEEL FITTINGS

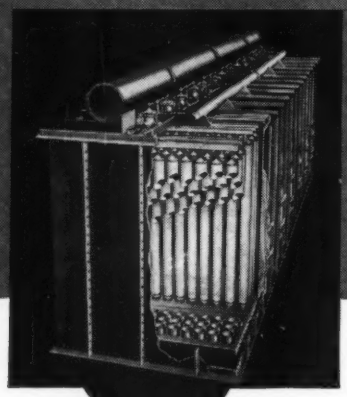
THE NEWEST THING IN PIPELINE ECONOMY

SPEEDLINE DISTRIBUTORS ARE LOCATED IN PRINCIPAL CITIES FROM COAST TO COAST

Manufactured by **HORACE T. POTTS COMPANY** • 522 E. Erie Avenue • Philadelphia 34, Penna.

Dust and Fume Collection by Norblo

helps you achieve efficiency and cleanliness in your plant



Norblo has developed bag type dust collection systems to a high degree of efficiency.

Norblo Automatic Bag Type

For continuous and heavy duty service at constant capacity and efficiency, Norblo Automatic Bag Type collection pays its own way — in recovery of valuable materials or removal of injurious or "nuisance" industrial air contaminants. Norblo builds the entire installation, from blowers to bag-cleaning mechanisms. Complete systems are engineered to meet specific situations. Norblo engineering insures low maintenance and no shut-downs — guarantees performance of every installation.

Norblo Standard Bag Type Collectors

Based on the same construction principles, the standard bag type collectors provide at low cost the high efficiency service that is obtainable only from bag-type cloth filtering, with either compressed air or electrically driven periodical bag shaking and cleaning. Units must be shut down for cleaning — at such times as the noon hour and end of working day.



Norblo Portable Type

For excellent results in localized dust control, Norblo Portables protect equipment and reduce maintenance in grinding, polishing and cutting departments. Six models cover capacities from 300 to 1350 cfm., at 8" static pressure at the fan. Occupy small space. Are unusually quiet.

Write for bulletins describing Norblo bag type dust collectors.

The Northern Blower Company

6426 Barberton Ave., Cleveland 2, Ohio • OLympic 1-1300

Norblo ENGINEERED DUST COLLECTION SYSTEMS FOR ALL INDUSTRIES

of information then is hampered.

Is it appropriate for consulting engineers to design machinery and then assemble purchased components with the resulting division of responsibility when that machinery is available from experienced manufacturers whose business is the design and manufacture of this equipment?

It is very difficult to provide a hard and fast rule to define a manufacturer's or consulting engineer's bounds and there are many borderline cases where a manufacturer's engineers may properly assist a customer with engineering as they assist the consulting engineer. Such engineering assistance is usually free to the consultant but paid for by the customer when he buys and hence seldom "actually" free.

H. A. Mayo, Jr., P. E.
Sales Engineer
S. Morgan Smith Co., York, Pa.

No Gentleman's Agreement

Sir:

In the October issue there is an article entitled "Report from the East Coast" describing the purported attempt of the Engineers and Scientists of America to organize the employees of consulting engineers.

On page 136, Joseph Amann, President of ESA, is quoted as follows: "Consulting engineers in New York have a gentleman's agreement between firms. I've been told that this agreement is that salaries will be practically identical in the different firms. A personal folder follows a man from one consultant's office to another. This is common talk among the employees."

On behalf of the New York Association of Consulting Engineers, I question the accuracy of the above statement. Our members have no such agreement, nor do we follow the alleged practice of the "personal folder" mentioned.

I have been the chief executive officer of my own engineering firm for the past fifteen years.



High-Rise Building . . .
High-Velocity System . . .
High-Quality ULTRALITE DUCT INSULATION

ULTRALITE, the long glass fiber duct insulation, is the logical choice for high-velocity air conditioning systems where cost and performance are prime considerations. There's a big saving in heat loss (or heat gain) due to ULTRALITE'S superior thermal efficiency. There's a big saving in application cost, too, because blanket rolls of ULTRALITE, with vapor barrier adhered, wrap quickly around ducts of every size and shape . . . and because ULTRALITE'S long-fiber strength makes it easy to secure in place by methods not practical with ordinary glass fiber blankets. It does not tear or lose thickness, and you get a nice looking job without "thin spots", for ULTRALITE always springs back to its original thickness. From every standpoint, ULTRALITE is the *best* duct insulation—yet it costs no more!

FOR COMPLETE INFORMATION ABOUT ULTRALITE DUCT INSULATION AND DUCT LINER, WRITE TODAY FOR SAMPLES AND A.I.A. BULLETINS.

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Thermal and acoustical glass fiber insulations • Pipe couplings and fittings
Molded glass fiber pipe insulation

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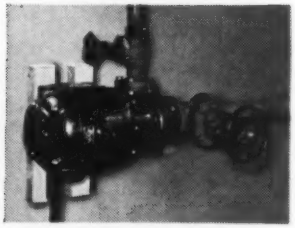
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A REMARKABLE, ALL-PURPOSE PUMP







Efficient, dependable, truly versatile . . . WEINMAN General Service Unipumps are America's finest economical, general purpose pumps.

Complete adaptability permits peak operating efficiency in *any position* . . . mounted horizontally, vertically, on floors or walls. So compact they install easily in a minimum of space. Truly, here is a pump for every application.

Available with enclosed or open type impeller . . . horsepower range, ½ to 50 . . . heads to 260 feet . . . capacities to 1800 gpm! Thousands are already in use, efficiently serving industrial, municipal and residential installations.

See your WEINMAN Pump Specialist for full information on WEINMAN General Service Unipumps. He'll be glad to help you with your pumping problems. His name is listed in the yellow pages of your telephone directory.



Write today, for *your free copy* of WEINMAN'S illustrated Bulletin 300, showing specifications, dimensions, construction features and *complete selection table* for WEINMAN General Service Unipumps.

THE WEINMAN PUMP MFG. CO.
290 SPRUCE ST. COLUMBUS 8, OHIO

Centrifugal Specialists

During this period, I have never seen anything resembling either the gentleman's agreement or the personal folder referred to.

Peter J. Reidy
President
New York Association of
Consulting Engineers

Sir:

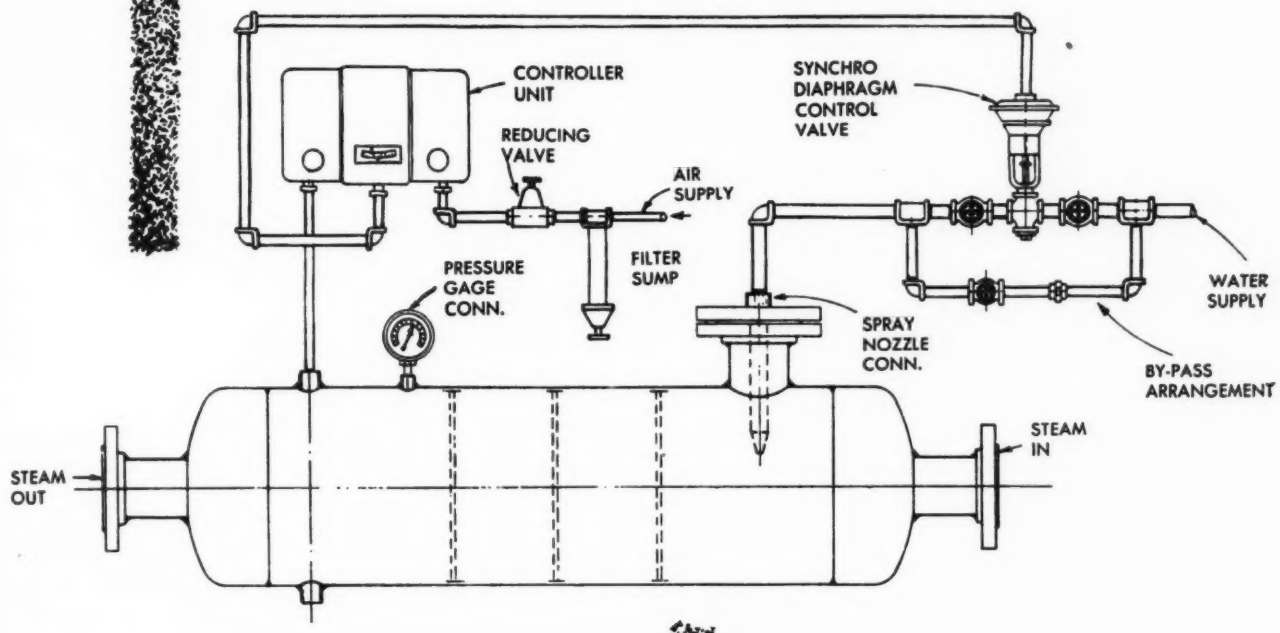
In "Report from the East Coast" in the October 1957 issue the statement is attributed to Joseph Amann, ESA President, that "Consulting engineers in New York have a gentleman's agreement between firms. I've been told that this agreement is that salaries will be practically identical in the different firms. A personal folder follows a man from one consultant's office to another. This is common talk among employees . . . There is no evidence that it exists. But we're strongly suspicious that it does."

So far as I know the only organization through which an agreement such as that referred to by Mr. Amann could be promulgated in New York City is the New York Association of Consulting Engineers. I wish to say for this organization that we do not have any such agreement either written or understood; we never have had such an agreement since the Association was founded; and we do not propose to institute any such procedure.

We do not believe that any valid purpose is served by the printing of false and potentially harmful material of this kind. The innocent disclaimer that "there is no evidence that it exists" does not, of course, have the same weight as the statement which precedes it might have. We feel that it is CONSULTING ENGINEER's responsibility to determine whether such an item has any basis in truth before it quotes the suspicions of irresponsible axe grinders.

Samuel A. Bogen
Secretary
New York Association of
Consulting Engineers

FOR EFFECTIVE EVAPORATION TYPE DESUPERHEATING SPECIFY WHITLOCK



This efficient "package" desuperheats steam and permits use of low pressure, economical equipment. Operating on the evaporation principle of heat removal, the Whitlock Evaporation Type Desuperheater offers these outstanding features:

- **Dependability over relatively great ranges of steam flow and steam temperatures.**
- **Total or partial desuperheating, as may be required.**
- **Positive action to preclude "flooding" of the desuperheater.**
- **A.S.M.E. Code design, construction, and stamping.**

Ask for Bulletin 150. We will gladly assist you in selecting and specifying heat transfer equipment.

Whitlock

Designers and builders of bends, coils, condensers, coolers, heat exchangers, heaters, piping, pressure vessels, receivers, reboilers.

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Who said dirt cheap?



Hospitals have a special need for air that's cleaned electronically. In operating rooms, nurseries, emergency rooms—in fact, throughout the hospital—it cuts down on airborne germs, giving important help in lowering the infection rate.



Many manufacturers of precision products find electronically cleaned air a near-essential to efficient production. It also eases maintenance problems caused by airborne dirt; and it keeps nuisance dirt off desks and files in office areas.

*New Honeywell Electronic Air Cleaner removes 6 times more costly dirt than mechanical filters**

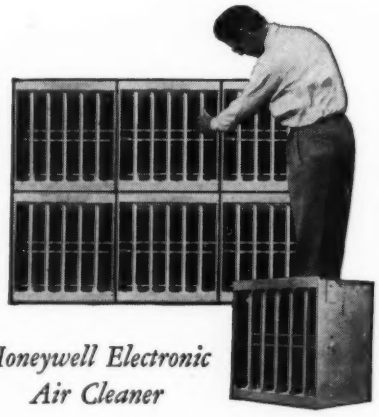
IN ADDITION to the cases shown above, most soiling of your client's work surfaces, walls, fixtures and merchandise is done by airborne particles less than 1/25,000 of an inch in size.

Particles much smaller than these—including the bacteria and viruses that cause many respiratory ills—can be removed by Honeywell's new Electronic Air Cleaner.

It is an impossible job for the mechanical type filter to remove oil smoke, fumes, tobacco smoke and much of the dust and fly ash that fall into this microscopic class of contaminants. And these are the ones with the greatest staining power.

The new Honeywell Air Cleaner's wide range of protection offers a scientific way to cut the high costs of cleaning, soiled merchandise, mechanical failures and absenteeism by trapping airborne dirt *before* it has a chance to steal your client's profits.

Your next job, whatever it is, can probably benefit from a Honeywell Electronic Air Cleaner. Specify it with confidence; the advantages more than pay for installation. For complete information, call your local Honeywell office or write Minneapolis-Honeywell, Dept. CO-12-226, Minneapolis 8, Minnesota.



Honeywell Electronic Air Cleaner

To aid the engineer—Honeywell makes a complete range of Electronic Air Cleaners for any type of air conditioning or ventilating system. Number of cells is determined by amount of air handled by the system. *Module construction* makes installing and servicing easy. Sales and service aid available in 112 Honeywell offices across the nation.

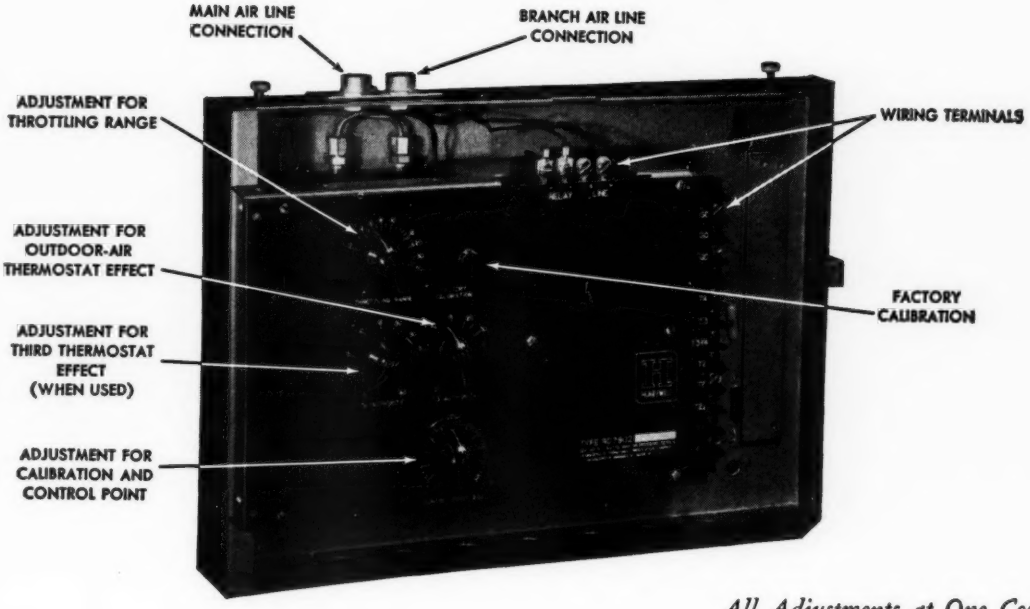
**According to the National Bureau of Standards tests, electronic air cleaners remove at least 90% of the dirt particles causing the greatest staining, while ordinary mechanical filters remove only about 15%.*

MINNEAPOLIS **Honeywell**

First in Controls

Easier way to do a better control job

Honeywell's New Electronic-Pneumatic Relay



All Adjustments at One Convenient Location

MEET THE RO7902, Honeywell's new electronic-pneumatic relay.

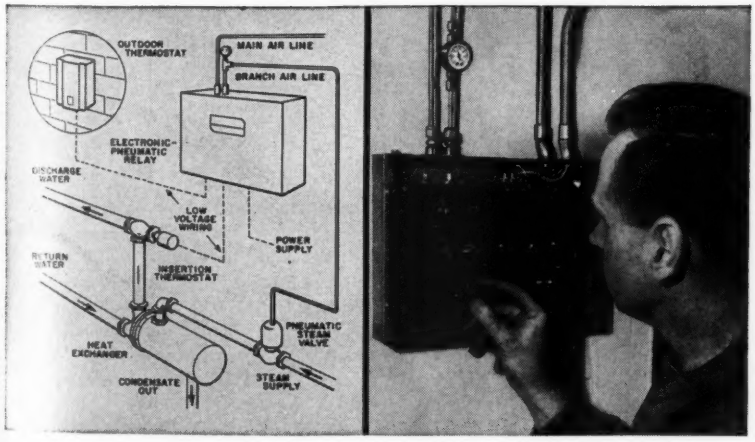
Together with its electronic thermostats it puts out a control air pressure—based on an electronic signal—for use with a standard pneumatic system.

This means that with only minor changes to your standard layouts the new RO7902 brings to your master-submaster jobs the speed and stability, the convenience and simplicity, of electronics. Here's how you benefit:

1. ***All calibration and set-up is carried out right at the relay—no traveling from one thermostat to another.***
2. ***Fewer adjustments are needed to put each system into operation.***
3. ***Adjustments are made merely by setting a knob instead of probing with a screwdriver into hard-to-get-at places.***
4. ***It's as easy to make changes later, or to trouble-shoot, as it is to make the initial set-up.***

All these benefits stem from the simplicity of the electronic thermostat. Entirely non-mechanical, it has no moving parts—no bellows, linkages or pilot-valves; its heart is a coil of fine wire in which changes in temperature induce changes in resistance. These changes, reaching the RO7902, are converted from minute low-voltage signals to changes in air pressure which activate the operator.

You'll want to know more about this easier, simpler way to get better control. For details about the new RO7902 relay, call your local Honeywell office. Or write to Minneapolis-Honeywell, Dept. CO-12-226, Minneapolis 8, Minnesota.



Simple, centralized hook-up

The diagram above shows how the basic control hook-up utilizing Honeywell's new Electronic-Pneumatic Relay parallels conventional master-submaster system. Big difference is convenience of centralized set-up, checking and adjustment.

All system adjustments made at panel

All settings and adjustments are made at the RO7902 relay. It can be mounted any distance from the thermostats, at the most convenient spot. Simple, standard, low-voltage wiring is used. Shielding is not required.

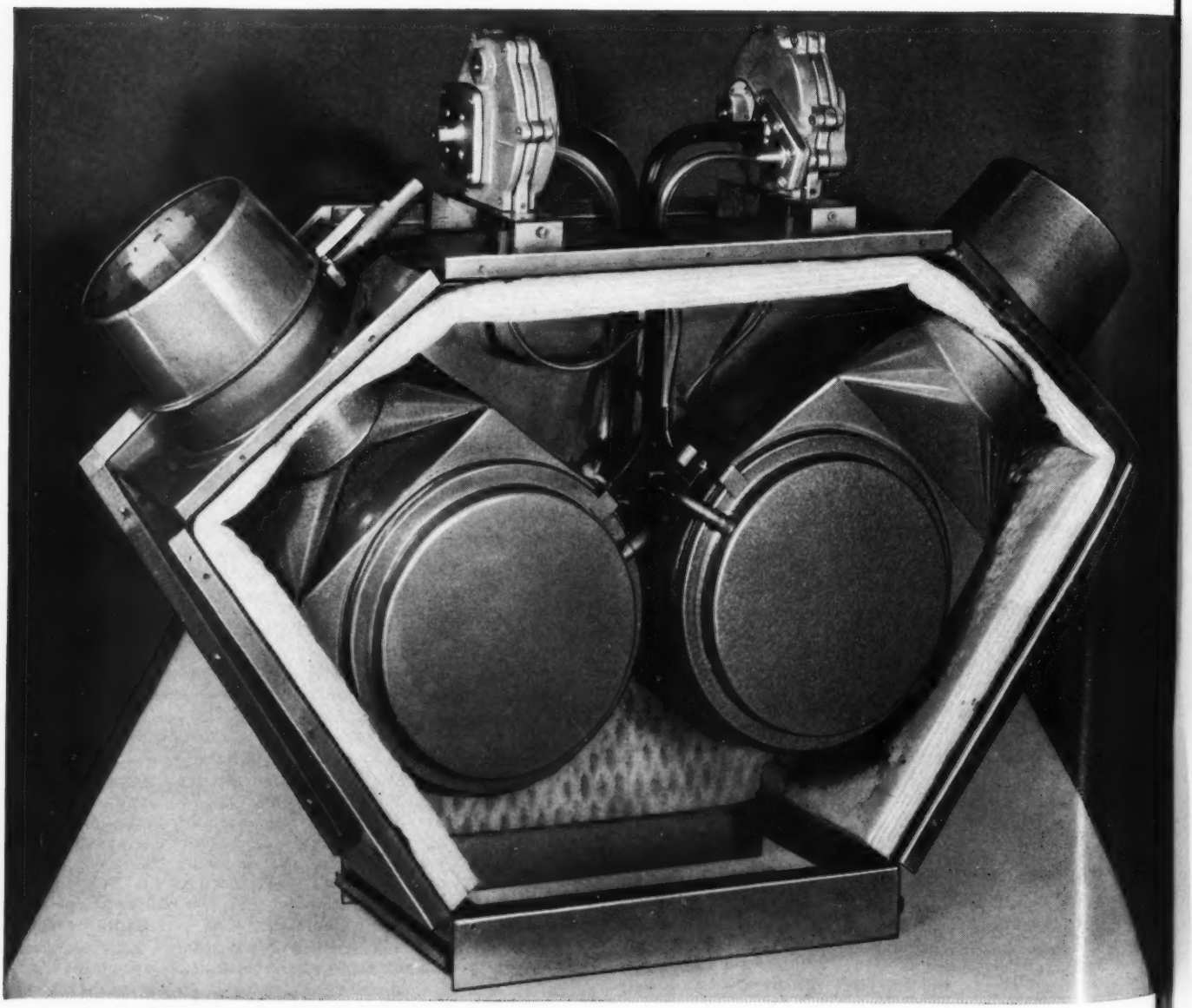
For news about another major Honeywell contribution to indoor climate, turn the page.→



Calibrated dial air balancing is the key to the superior performance of the Honeywell High Velocity Air Blender. You adjust dial only once, need never recalibrate again. Once balanced, comfort control is in the hands of the system thermostats.

Dial Air Balancing

NEW HONEYWELL HIGH VELOCITY



Fits any mixing box. The configuration you see here is but one of the many possible for ceiling units. Also, it's now available in nearly every under-the-window type unit. From the new Honeywell Blender you can expect controlled volume of air, constant CFM, long valve life and simplified control. The thermostat in the system controls temperature by controlling the volume of hot air passed by the hot duct. At the same time a flow regulator provides a constant hot air volume for a given thermostat signal under variations in supply duct pressures. A constant total flow is provided by a total flow regulator which operates the cold air valve to make up the difference between hot flow and desired total flow.

Control leadership through advanced engineering—research

AIR BLENDER SOLVES DUAL-DUCT DISTRIBUTION PROBLEMS

Provides constant delivered air volume, needs no recalibration when you add to system

WITH THE new Honeywell Air Blender your clients get the level of comfort they want—on the simple call of the room thermostat.

They get this easily, because the Honeywell Air Blender combines temperature and volume control in one unit.

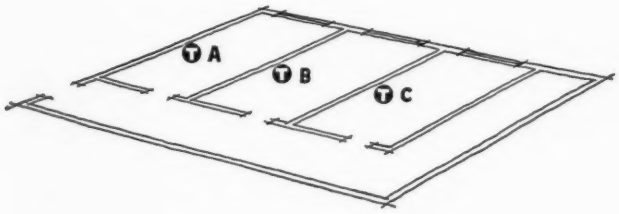
And comfort doesn't come at the expense of some other room. It comes from the system. *One room no longer "robs" another of comfort.*

Besides providing constant delivered air volume, the Honeywell Air Blender takes well to change. With Dial Air Balancing you can add to the system without having to recalibrate distribution points that may be scattered widely—especially valuable in floor by floor modernization or on new construction.

Self-powered, the Honeywell Air Blender uses the pressure of the air it is controlling to actuate the diaphragm—its only moving part. Such simplicity makes possible long life and trouble-free performance.

For further information about the Honeywell High Velocity Air Blender and other Honeywell heating and air conditioning products, call your local Honeywell office. Or write to Minneapolis-Honeywell, Dept. CO-12-226, Minneapolis 8, Minnesota.

No room "robs" comfort from another



For the first time in high velocity air handling history you can design a system where adjustment in one room doesn't upset comfort balance in others. Thus, in a typical office, adjustment in area A does not rob comfort from B or C. Neither delivered air volume, nor the ratio of hot to cold air is affected in B or C. This is one of the reasons why it's wise to design with the new Honeywell Air Blender in mind.

The "new" look in thermostats that's appearing on walls of commercial buildings throughout America. New design *inside* gives closer control, vastly superior performance.



Only Honeywell gives you all four—pneumatic, electric, electronic, instruments.

Honeywell

First in Controls



Scraps & Shavings

THE ARTICLE, "I Gave Up Ethics — To Eat!," published in this issue, is not presented to presage an attempt to turn this magazine into a "true confessions" type of publication. Far from it. Instead, nothing would have pleased us more than to learn that this story represents such an isolated instance of unethical conduct that search as we would, no other example could be found.

Unfortunately, we find that this story is unique only in that it is in print. We have, just in the last week, talked with three engineers who work primarily for governments, and each admitted that commission agents are enjoying a healthy income from consulting engineers. While they, themselves, do not use that means of getting business, each explained that "many of my competitors do." Two other engineers told us that the reason they had moved to other parts of the country was to get away from the need for commissions or kickbacks to public officials in their former location.

We hope that this article will start some soul searching. A commission agent under any other name smells no sweeter. When they call themselves public relations counsels or business consultants they not only lower the ethical standards of the consulting engineers for whom they work, but they blacken the name of other reputable occupations. Those persons honorably engaged in public relations activities have enough problems without carrying the onus of commission agents in sheep's clothing.

And where does one draw the line between paying 10 percent to a confessed commission agent and budgeting 10 percent of the firm's gross income to a New Business Department.

This whole matter of professional ethics needs attention. Every engineering organization, whether predominantly professional, technical, or commercial in nature, professes great interest in ethics. Yet little has been done about ethics by any of them. It is necessary, first, to explain clearly what is ethical and what is not. The National Society of Professional Engineers has just published a small booklet explaining each item in the Canon of Ethics in some detail, but this is only a small step — a token recognition of lack of agreement. An understanding of professional ethics can come about only through the process of compiling case after case (as the common law has come into being), not by simply amplifying a code.

Even where the unethical is obvious, it is not policed nor are the offenders rejected by fellow professionals. NSPE has given much lip service but taken almost no action within their own membership. Most of their actions have been against those who were not professionals but pretended to be. They have protected professional engineers from the competition of the nonregistered, but not from the unethical activities of their own members. The American Society of Civil Engineers took a strong action against competitive bidding a few years ago and then retreated behind a change in their own Code of Ethics.

We also have learned that more than a few consulting engineers hold patents and receive royalties on devices they are called upon to specify for their clients. That makes them about as independent as manufacturers who offer "free engineering."

The publication of the article, "I Gave Up Ethics — To Eat!" (and the mention of these few examples) does not mean that the private practice of engineering in the United States is akin to a racket. Instead, it means that we must face the fact that there is still much to be done. Our house is fairly clean, but there are still corners to sweep and some dirt under rugs.

We also might suggest to the consulting engineers of Europe that while they put up a very clean front, their back yards could stand some raking. In every European country we have visited, we have been given examples of unethical professional conduct — in neighboring countries, of course. A now well known affair involving a foreign consulting engineer's efforts to direct toward certain firms and certain countries engineering work from World Bank financed projects is playing with ethics on a far grander scale than any American consulting firm would believe possible.

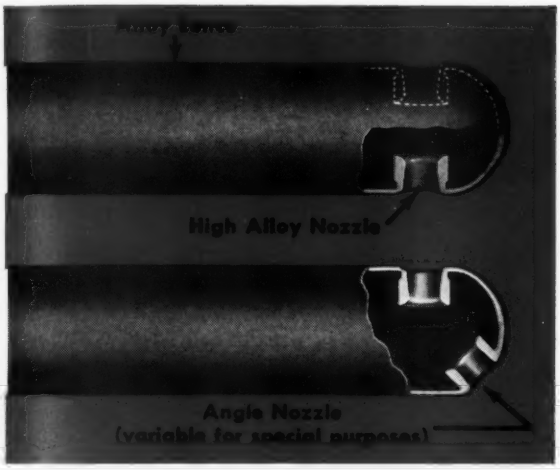
Again, this proves that unethical professional conduct is no more limited by geography than is sin. There are dirty little corners all over the world, and it is up to every engineering society, association, council, institute, or institution to clean up the dirt wherever it can. ▲▲

IMPROVED BLOWER NOZZLE

another important feature of the

New Diamond Series 300 IK

LONG RETRACTING BLOWER

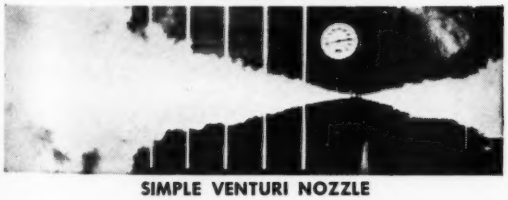


This improved nozzle provides more available cleaning energy per pound of steam or compressed air. A modified venturi, it is the result of extensive research during which more than 50 contours were tested.

This feature is one of many reasons why the Diamond Series 300 IK Blower does a better and more economical job of cleaning surfaces which require a long retracting blower. Other advantages are listed at the bottom of the page. Ask the nearest Diamond office or write directly to Lancaster for Bulletin CE 2111 which will tell you much more about the new Series 300 IK.



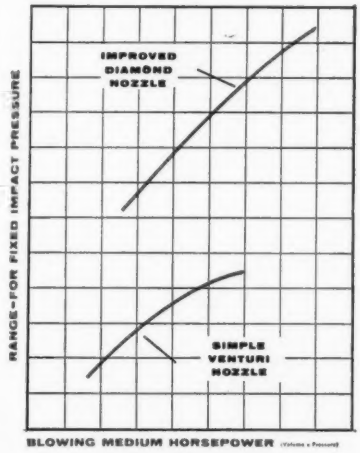
IMPROVED DIAMOND NOZZLE



SIMPLE VENTURI NOZZLE

Improved Diamond Type "A" Nozzle has low approach velocity for optimum nozzle performance (see curves below). It provides greatest impact for any given blowing pressure . . . means greater effectiveness and economy.

Note the greater blowing range of the improved Diamond Nozzle when compared with a simple venturi nozzle under identical test conditions.



7859



DIAMOND POWER SPECIALTY CORP.
LANCASTER, OHIO

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OTHER ADVANTAGES OF SERIES 300 IK BLOWERS

- Backbone and Protective Cover
- Front End Single-Motor Drive
- Compact, Accessible Electric Power and Control Terminal Facilities
- Positive Gear Carriage Drive
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- Positive Mechanically Operated Valve
- Improved Cleaning Pattern
- Single Point Outboard Suspension
- Oversize Lance (Step-Tapered for Extra Long Travel)
- Auxiliary Carriages for Extra Long Travel
- Designed for Quick, Easy Servicing

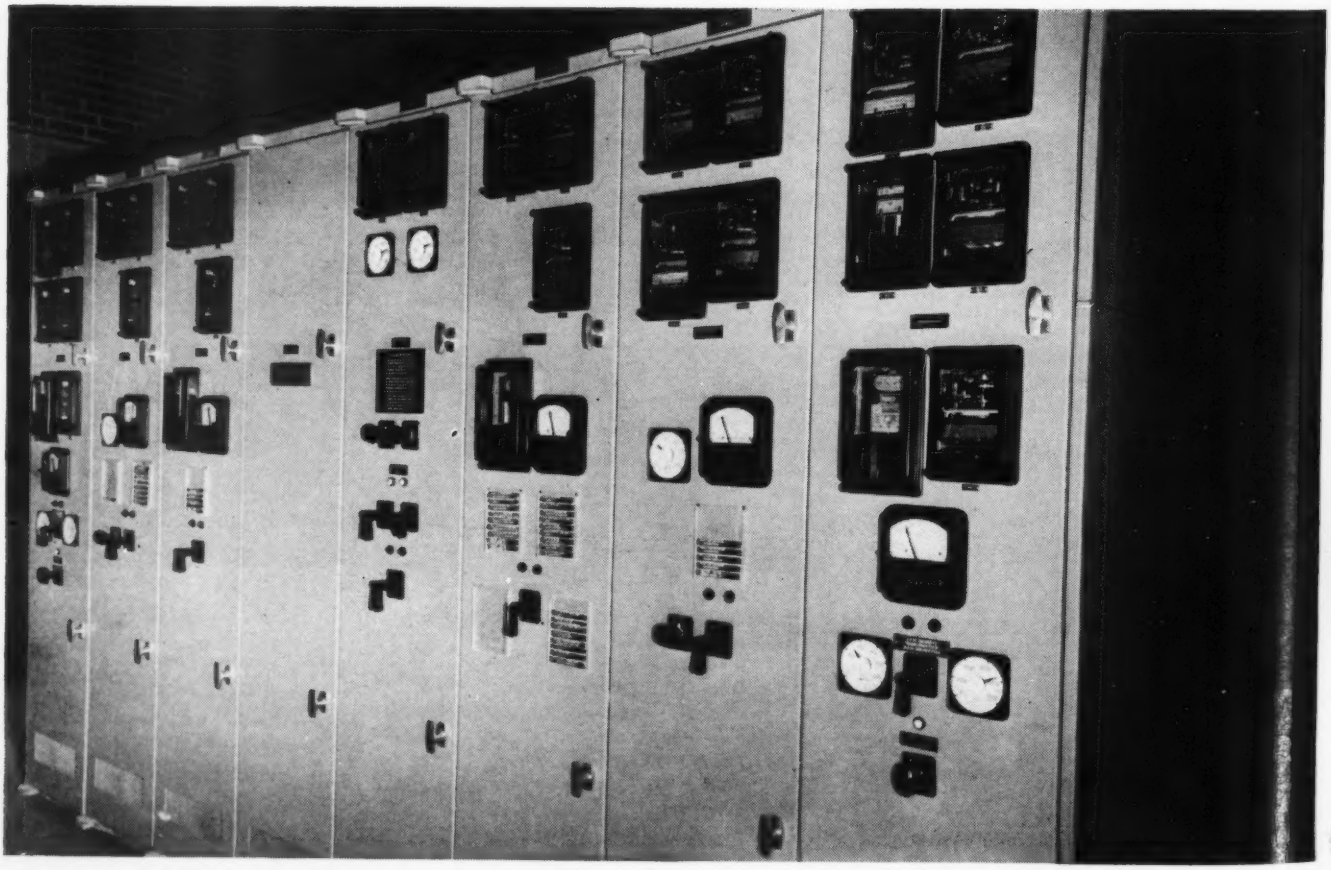
No other blower gives you all these advantages.

First 5 kv Breaker in



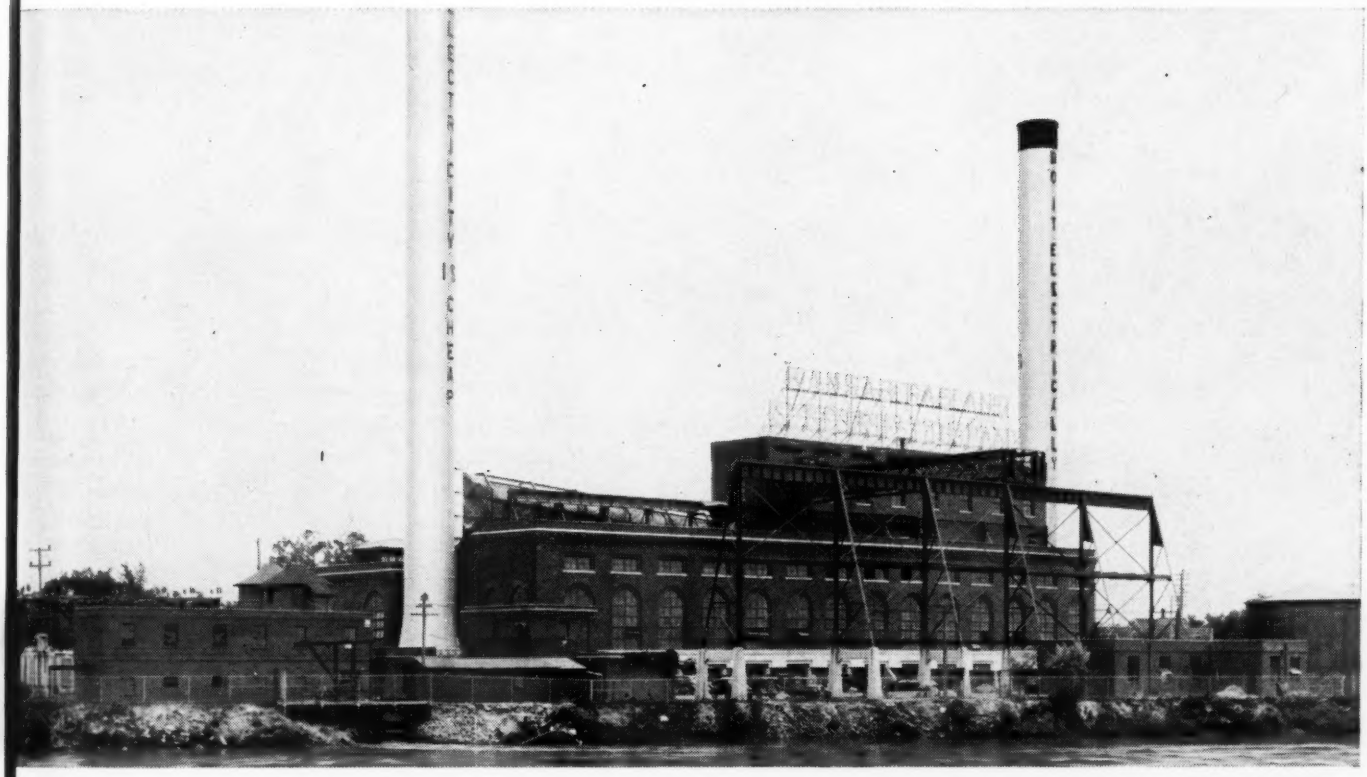
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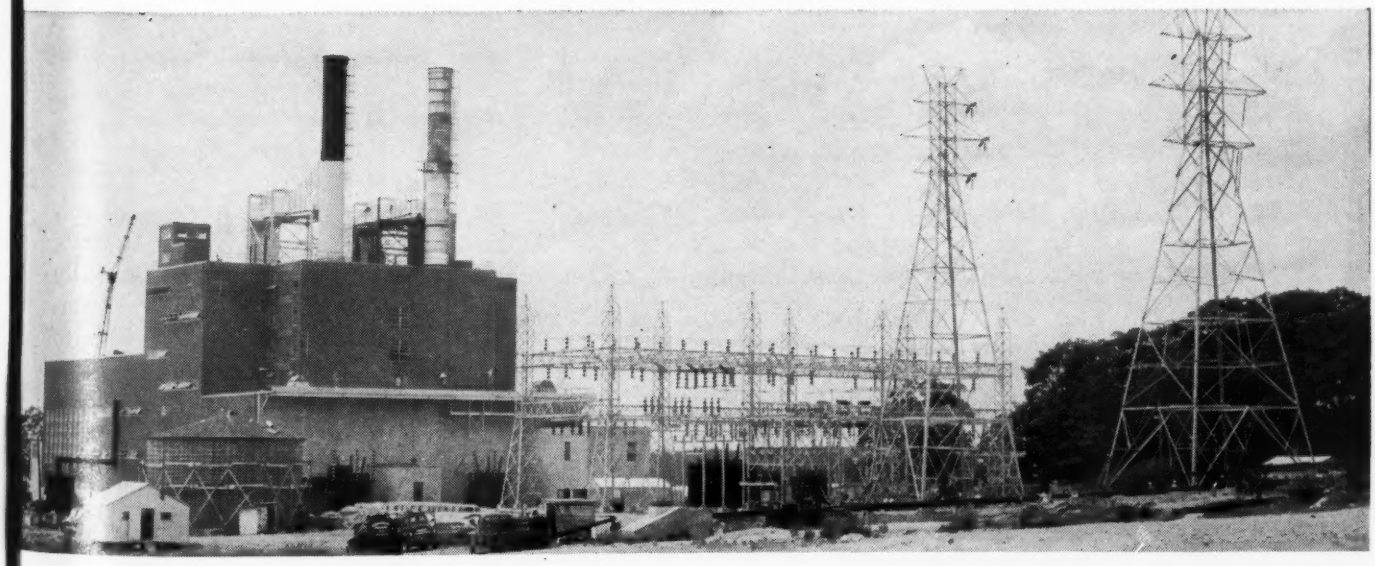


Installation at Esso Standard Oil Co., Baton Rouge, La.

350,000 kva Rating



Kansas Gas and Light Co., Wichita, Kans.



Central Maine Power Co., Augusta, Maine

SWITCHGEAR DIVISION

I-T-E CIRCUIT BREAKER COMPANY

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The Word *from* Washington

EDGAR A. POE
Consulting Engineer Correspondent



THE Senate Public Works Committee says some engineers are estimating that by 1980 electric consumption in the United States may be 16 times as much as it was in 1956, which was 16 times greater than 1920. Therefore, Congress appears likely to give additional consideration next session to development of hydroelectric power. In a report to Congress in 1957, the committee insisted that the investment in power generation by Federal projects is self-liquidating and returns interest on the Federal investment. Revenue from this source in the fiscal year 1954 was $28,213,153, and in fiscal 1956 it had increased to $51,246,212.

MEMBERS of the Joint Congressional Committee on Atomic Energy will recommend to Congress, in January, that the United States step up its atomic energy program. The committee, headed by Senator Albert Gore of Tennessee, is convinced that Russia is making an all-out effort to jump ahead of the United States in the atomic energy field — as she has in the satellite field.

The Congressional Committeemen inspected some of the atomic power programs in Russia, Britain, and Western Europe. They said that the Russian atomic reactor research program is somewhat similar to that of the United States.

LAUNCHING of the Russian Sputnik, not only made a strong impression in official circles in the Nation's Capital, but is resulting in a series of changes inside the government. Despite a few having down graded the Soviet satellite, more lights are burning at night in the Pentagon than at any time since the Korean war. The National Security Council is holding extended huddles close by the President's office. A heavy curtain of secrecy still cloaks the entire satellite program of the United States, but every group at work on missiles is passing out publicity as though promoting a new soap.

Some members of the House and Senate Armed Services Committees predict that Congress will give the Civil Service Commission broader authority to pay engineers and scientists salaries above current grade maximums. To do this Congress would have to remove the restriction on the number of employees in Civil Service Classifications 16, 17, and 18, which pay up to $16,000, plus fringe benefits. There is some sentiment to pay key scientists and engineers up to $18,000 a year.

Dr. Howard L. Bevis, chairman of President Eisenhower's Committee on Engineers and Scientists, declares that the United States is desperately in need of more skilled personnel "if we are to survive in this highly competitive technological field." Dr. Bevis said indications are that the Nation's skilled manpower shortage will be a national problem of major proportions at least until 1965.

THE Rural Electrification Administration, long a target of many congressmen because it is subsidized, is scheduled to get a working over in the next session. Hearings will be conducted on pending House and Senate bills that would double the current 2 percent interest rate on new REA loans. Existing loans would be unaffected. With an estimated 95 percent of the Nation's farms now electrified, some congressmen are questioning the soundness of the Federal government loaning money to REA at 2 percent when it costs the Treasury nearly 4 percent plus other costs to borrow the money.

TENNESSEE Governor Frank G. Clement advised fellow Southern Governors that because of the engineering shortage his State successfully employed consulting engineers. He said their engineering work has been of tremendous value to the Tennessee Highway Department.

AN Atomic Energy Commission spokesman is convinced that beginning in the 1960's an increasing proportion of new electric generating capacity added in the United States each year will be nuclear. Near the end of the century, more than three-fourths of total additions will be nuclear.

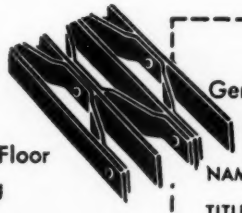
Louis H. Roddis, Jr., the AEC's deputy director of the division of reactor development, says energy demands are likely to continue the spectacular increases which have occurred in recent years. Economically recoverable supplies of fossil fuels appear insufficient to meet the demands. Thus, nuclear energy will have to meet most shortages. ▲▲



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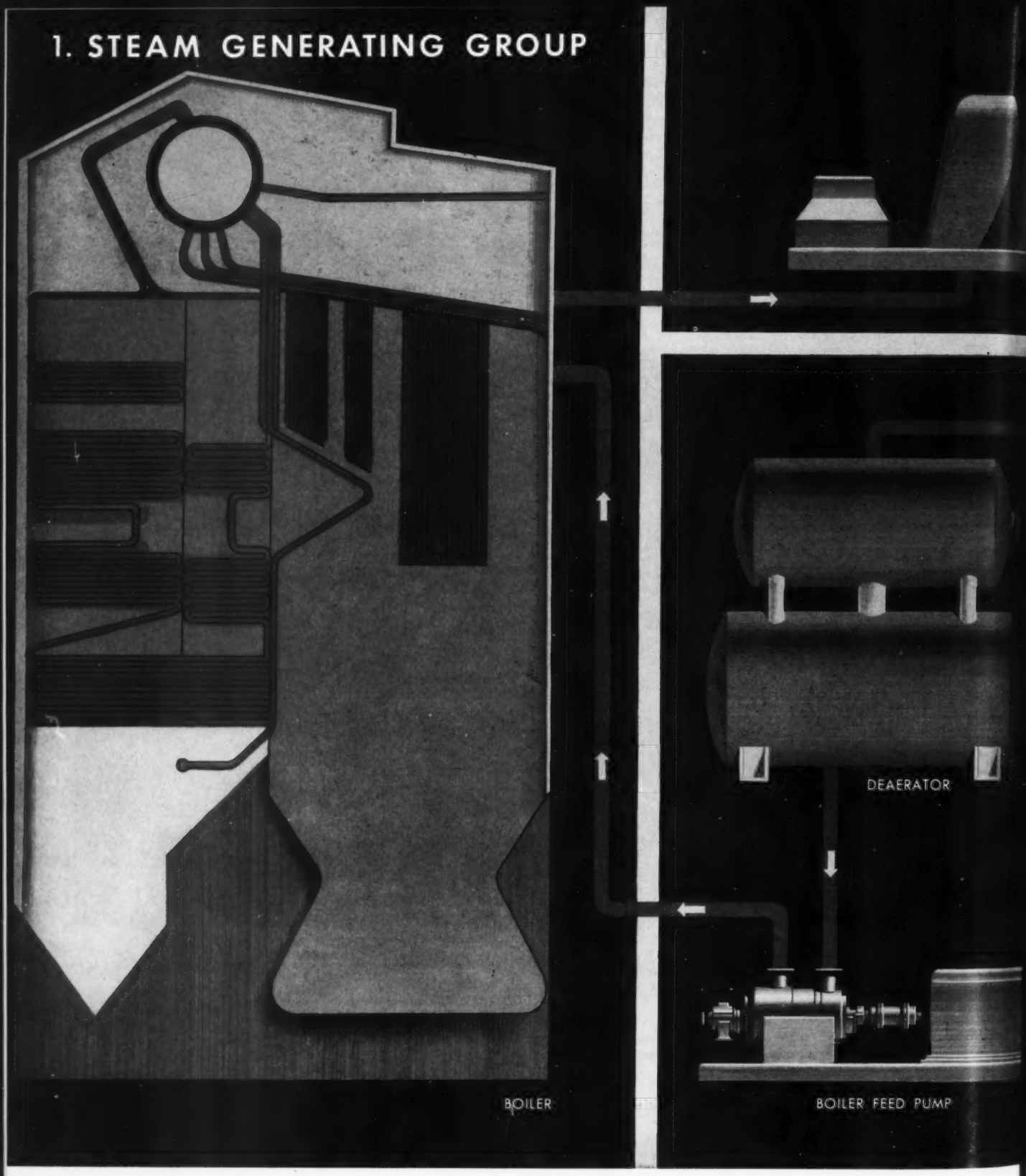
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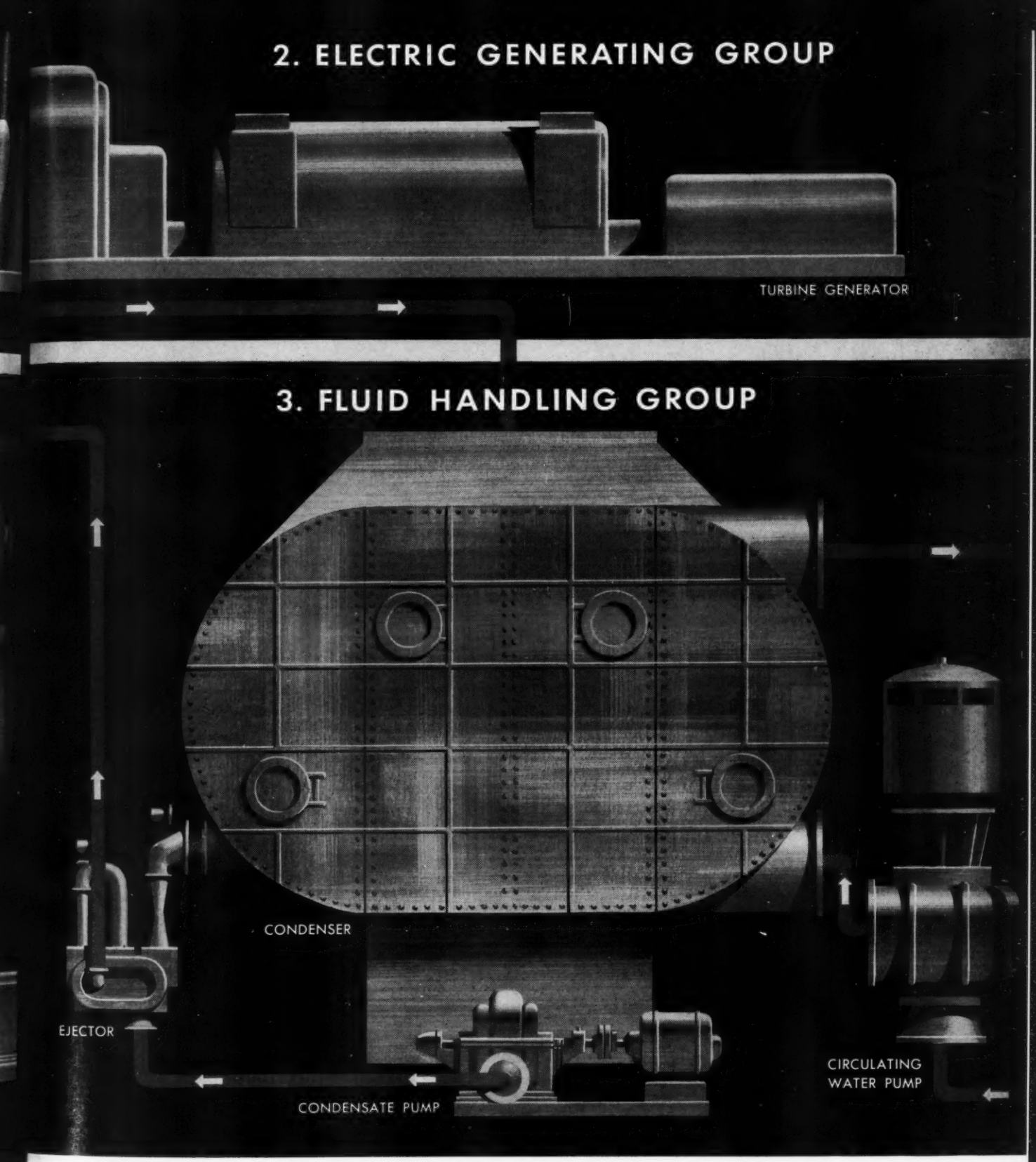
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WORTHINGTON



The Reader's Guide

The anonymous article on page 72, "I Gave Up Ethics — To Eat!" is by no means the longest article in this issue, but it will be the most read. It deals with the situation in which a consulting engineer, specializing in public works, found himself when he started in private practice. He had to make a choice between unethical practices or closing his office. The article needs no explanation. It is all too clear — and disheartening. For further comments on the ethics of the profession, see "Scraps and Shavings," on page 26.

Self-Service

Like the shoes of the shoemaker's children, engineers' offices are not always indicative. Many a fine engineer still has his offices in the back room of an antiquated office building. While physical surrounding need not reflect the type of work being done, an advanced design for an office building can be an excellent advertisement for the occupant. We think that one of the most attractive new buildings we have seen is that of Ketchum and Konkel, in Denver, Colorado. Milo Ketchum is a well known structural engineer, and he has done much to promote the use of thin shell structure. His own new building is of an excellent thin shell design, proving that he practices what he preaches. For a description of this new building, designed for efficiency, see the article written by Ketchum and his young partner, E. Vernon Konkel, on page 75.

Nuclear Engineering

Never before have we carried an article as long as the one in this issue on "Fundamentals of Nuclear Power," by John Lee, of North Carolina State College. But there is no topic that will have so much influence on consulting engineers in the years ahead. Many electrical, mechanical, civil, structural, and chemical engineers are going to find themselves called upon to work on projects involving the generation of power from nuclear energy. Yet, it is obvious that consulting engineers are generally unfamiliar with nuclear engineering. This is not a good sign. If we go back a few years to the early development of steam power, we find independent engineers (or their nearest equivalent in that period) taking the lead in technological development. The same was only slightly less true when the age of steam began to give way to the age of electricity. But nuclear research and development today is largely in the hands of the research scientist and engineers in the employ of manufacturers. Because of the nature of the beast, we find that many government engineers are more familiar with nuclear engineering than are independent practitioners. While some few consultants know their nuclear engineering, most, unfortunately, are content to deal with the more familiar and leave new ideas to others. We cannot hope, even in an 18-page article, to give more than a brief summary of terms and topics in nuclear power, but a careful study of this material will make you more conversant with the field and perhaps lead to detailed study of those aspects of particular interest.

Christmas Gift

"Year End Tax Planning" is the second article by Carl Ristau (CPA) we have published this year. Many of our readers found his earlier article ("Entertainment, Travel, and Your Income Tax," published in September) of considerable value, and we feel certain that this new article will also save money for you. It would seem that you will have the lowest income tax over a two-year period if you have about the same income for each of those years rather than a high income one year and a low one the next. If you speed up or slow down collections, or if you prepay or delay payment of your bills, you may be able to save enough money to buy your wife a nice Christmas present or take her along on the next Consulting Engineers' European Tour. The article explaining this will be found on page 100.



Atoms in Action

HAROLD S. VANCE, of the AEC, speaking at the industrial preview of the Engineering Test Reactor at Idaho Falls, estimated that in 10 to 12 years industry will have completely taken over the field of peaceful uses of atomic energy; our institutions of higher learning will have developed nuclear science as a regular part of their courses in general science; and that the AEC, while of necessity continuing in the field of military applications, will have limited its participation in peaceful uses of the atom to basic and fundamental research rather than operation of facilities.

ANOTHER "ten-years-from-now" prediction comes from Dr. Norman Hilberry, director of Argonne National Laboratory, "If we are smart and diligent, we should be ready well within 10 years to begin adding nuclear plants to our power networks on the same economic basis used to justify any other type of plant."

THE NEW scientific uranium prospecting technique known as geochemistry is credited with discovery of a deposit of subsurface uranium ore on Blue Mountain, north of the Spokane Indian Reservation in the State of Washington. Soil profiles based on geochemical sampling in two separate drainages on the east side of the mountain indicated the presence of uranium but geiger counters and geophysical prospecting instruments were unable to locate it because of a rock and soil cover that blocked out gamma irradiation. Instead, drilling and bulldozing sites were chosen by interpretation of the geochemical tests together with known geological data.

AEC HAS EXTENDED a general invitation to U.S. firms to submit proposals to design, develop, construct, and test operate a boiling water nuclear reactor and conventional fuel-fired superheater power plant with a design capacity of 22,000 kilowatts, to be installed in the system of the Rural Cooperative Power Association, Elk River, Minn. The invitation is being issued because agreement on a ceiling price to the Commission could not be reached with the American Machine and Foundry Co., which was to supply the reactor under the original proposal of the Cooperative.

PLANS TO NEGOTIATE a contract with Foster Wheeler Corp. for development and construction of a demonstration homogeneous reactor power plant for operation by the Wolverine Electric Cooperative of Big Rapids, Mich., have been cancelled by the Atomic Energy Commission. Wolverine had proposed joint participation with the AEC in development, design, construction, and operation of a 10,000-kw aqueous homogeneous plant with the Commission paying for and retaining title to the reactor and associated equipment. Total cost to the Commission was not to exceed $5,472,000, the amount appropriated by Congress for the project. However, Foster Wheeler withdrew its offer to undertake development and construction at a ceiling price and instead proposed a cost basis — with an estimated cost of $14,436,000. AEC now is undertaking a detailed cost analysis of its own, and this information, together with cost data gained from operation of its Homogeneous Reactor Experiment No. 2 at Oak Ridge, will determine whether or not the Commission will invite other bids.

A NEW RESEARCH TOOL, the Oaschger Counter, is being used by Swiss glacier scientists to measure minute amounts of atomic radiation left by events that occurred up to 60,000 years ago. With its help they expect to be able to date and measure historic weather cycles as shown by the age and thickness of the successive layers of ice that have been gliding down Swiss mountains for the last one quarter million years. With these weather records meteorologists may be able to start very long range weather forecasts. Physicists also believe the counter will enable them to calculate the amount of radiation on earth before man began producing radioactive fallout in 1945.

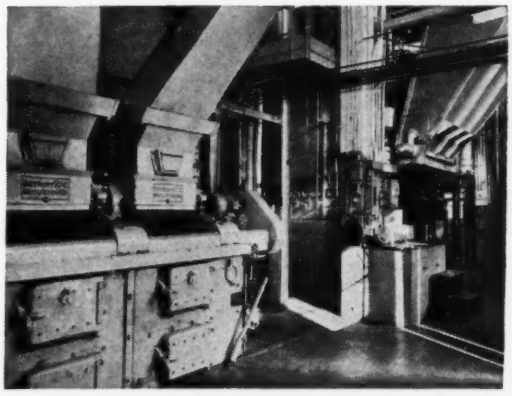
KAISER ENGINEERS has been awarded the contract to perform engineering design of a natural uranium, graphite moderated, gas cooled nuclear power plant of 40,000-kw capacity. Kaiser has retained ACF Industries, Inc. as nuclear design subcontractor. KE was selected from among the 31 architect-engineer firms that responded to the AEC's August invitation for proposals to do the design work. ▲▲


Carlisle Tire
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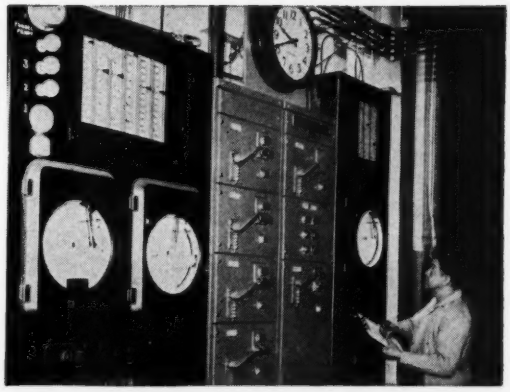
takes fuel costs for a ride

With increased fuel efficiency, Carlisle Tire and Rubber burns coal . . . holds costs to minimum while upping production 20%

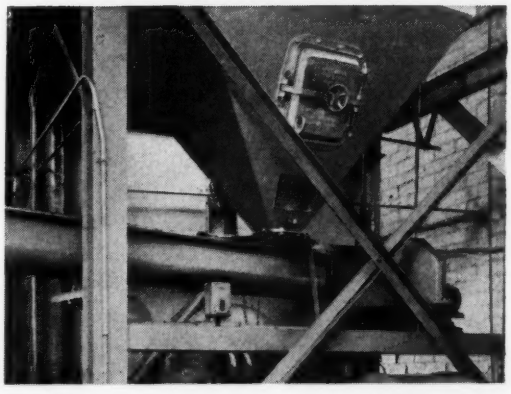
At the Carlisle Tire and Rubber Division of Carlisle Corp., Carlisle, Pa., the steam produced by the power plant is used primarily for processing. As production of bicycle tires, inner tubes and other rubber products increased, the firm's engineering department decided to boost steam capacity with modern coal-burning facilities. Coal was used on the basis of cost—25% less than the nearest competitive fuel. The result has been a dependable steam supply, cleanliness of operation and a jump in operating efficiency. Today the plant consumes the same tonnage of coal as before modernization although production has increased 20%!



Firing aisle of Carlisle's power plant. Left foreground is new 20,000 lbs./hr. boiler by E. Keeler Co., fired by Detroit Rotostokers. In the rear is an Erie City Water Tube Boiler (equipped with Erie City Spreader Stokers), used as stand-by unit.



Close-up of control panel, by Hagan Corp. These controls—regulating furnace draft, steam flow, air flow, flue gas temperature, stoker control—constitute a complete, automatic combustion control system.



Fly ash is collected by this Prat-Daniel Mechanical Precipitator. Fly ash is gravity-fed from the hopper (at top of photograph) into completely-enclosed screw conveyor which moves it cleanly to the disposal point.

Facts you should know about coal

Not only is bituminous coal the lowest-cost fuel in most industrial areas, as in the case of Carlisle, but up-to-date coal burning equipment can give you 10% to 40% more steam per dollar on the average. Today's automatic equipment pares labor costs and eliminates smoke problems. And vast coal reserves plus mechanized production methods mean a constantly plentiful supply of coal at stable prices.

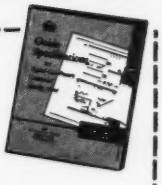
Technical advisory service

All companies planning a new power plant, or the remodeling of a present one, should consult an engineering firm on its design and construction. As a matter of fact, every Bituminous Coal Institute advertisement advises its readers to take this step. When you have such a project, our Engineering Staff will be glad to assist you in your fuel cost survey with any coal information you may require.

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Report from the West Coast

RALPH S. TORGERSON
CONSULTING ENGINEER CORRESPONDENT

DELAYS IN GETTING the big Federal highway program under way have been attributed in considerable measure to insufficient engineering personnel in the state highway departments. With the exception of the State of Washington, consulting engineers on the West Coast have not been called upon to take any appreciable part in relieving state highway departments of the increasing engineering load brought about by Federal highway work.

The view has been expressed by some highway department spokesmen that more engineering work was not given to consulting engineers because few consultants have had enough experience in highway work. Work by inexperienced firms involves too much time for checking by highway department engineering personnel. Opposing this view are many consulting engineers who point to years of experience in municipal and county work involving soil tests, bridge design, and highway work.

Although consulting engineers recently have obtained more work from municipalities, counties, and other governmental agencies, there has been a tendency in certain areas to resist the placing of engineering contracts with private consultants. The engineering departments of these government agencies like to build up their staffs, using as an excuse a big construction program, which often involves a peak demand that will not be normal or recurring.

Manuel Pasillas, of Braun and Pasillas, civil engineers, Fresno, Calif., commenting on this problem, said, "We have not undertaken any projects on a state-wide level, but we have done a Federal-aid secondary road project for the County of Fresno. The project is Manning avenue, 7.5 miles in length with three bridges, 70 feet, 70 feet, and 180 feet in length and 20- and 30-ft spans. Total estimated cost was $477,792; actual final cost being $474,815.89.

"In proceeding with the project, we met with county and state officials approximately six times to discuss the project, each meeting lasting two to three hours. From these conferences we were able to follow the project to completion. The work under our contract consisted of preliminary surveying, construction plans, and special specifications. The County of Fresno did all administrative work, prepared general specifications, handled advertising, and secured right of way. The construction, surveying, and inspection was done by the California Division of Highways.

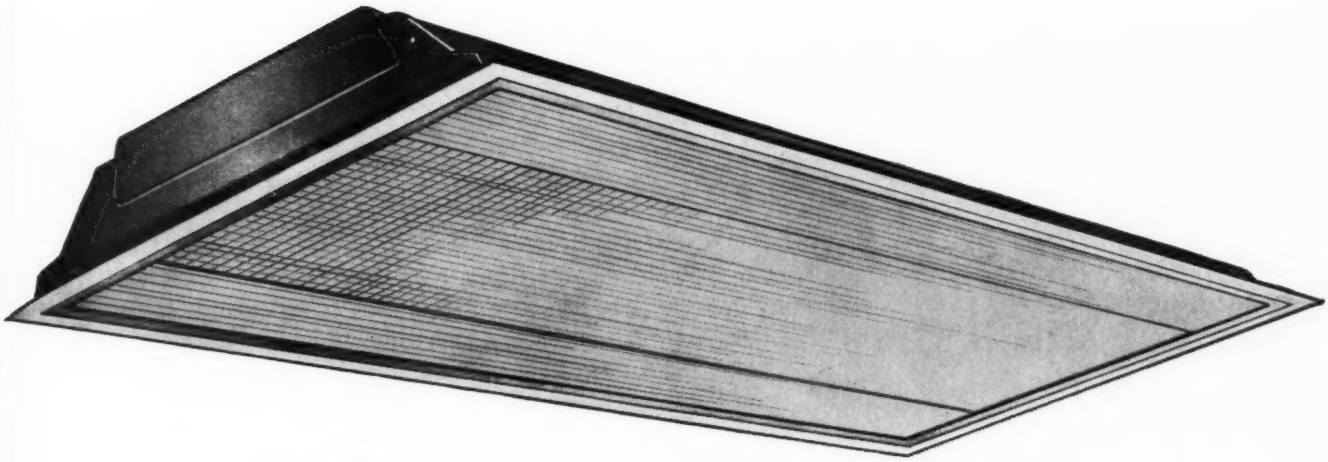
"We find that government agencies tend to staff for peak loads rather than to contract the work to private engineering firms," Pasillas said, "however, officials are becoming aware of this waste of money, and we feel they will slowly rectify this condition."

William W. Brewer, of Brewer and Associates, San Francisco, Calif., consulting foundation engineers, believes that engineers in private practice are well qualified to supply engineering service to highway departments in connection with the Federal highway program.

"As you are doubtless aware, the engineering for the Federal highway program in California is handled entirely by the Division of Highways, Department of Public Works. While the services of private engineers, including our own firm, are available to the Division of Highways, I do not know of any specific instance in which the private engineer has been engaged on the Federal highway program.

"Although we have had no opportunity to do any engineering work for the State Highway Department in California, we have provided engineering service to municipalities and counties on their road work.

"While there are many competent engineers within the Division of Highways, I do not believe that private consulting engineers lack experience in



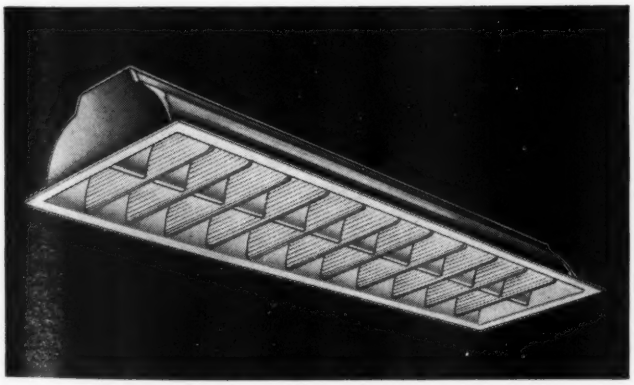
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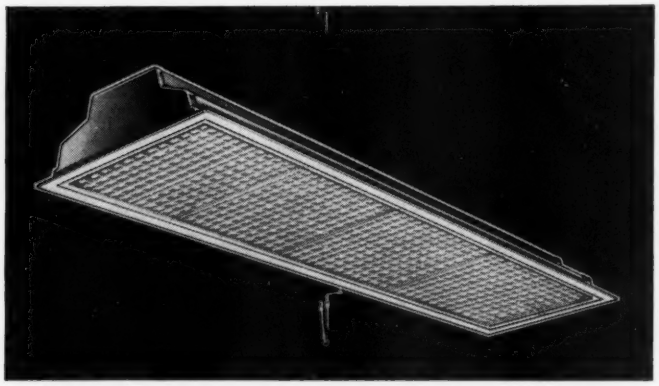
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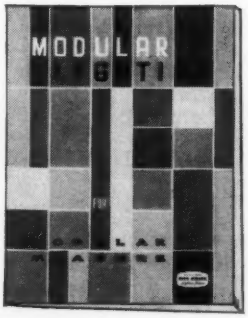


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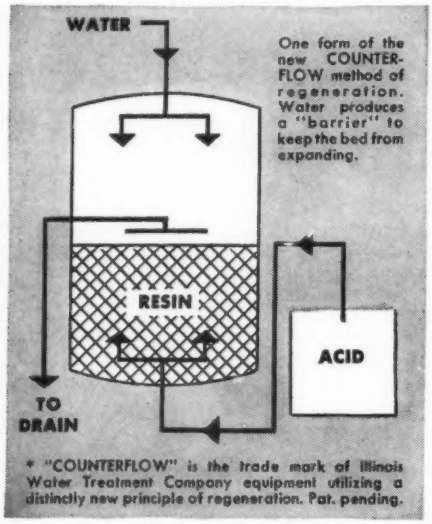
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highway work. I know of a number of private engineering firms who would be very competent in assisting and expediting the Federal highway program in California. We are civil engineers and specialize in the field of foundation engineering and soil mechanics, a field closely related to highway engineering problems.

"Our experience indicates to us that other State departments are more likely to engage private engineers than the California Division of Highways. Further, our experience has been that the municipal, county, and Federal agencies retain engineers in private practice to a far greater extent than the State."

Municipal Work

Paul L. Adamson, Palo Alto, Calif., civil engineer, reports, "I have not done any work directly for state highway departments. However, I recently completed a small bridge job ($50,000 construction cost) for a California city which required checking by the State because gas tax funds were used to finance it. The State highway district and the bridge department approved the plans and specifications upon first submittal without comment, so it would not appear that our 'lack of experience' placed too much burden on them in their checking.

"We do considerable work for municipalities. There I have observed that any resistance to letting work to private engineers does not come from the city government, city manager, or city engineer, but from the city engineer's staff, where I have been told many times, with apparent resentment, 'we have to let out all the good jobs to private engineers, all we get is the dog work.' Having been in the past a civil service employee with both the State Bridge Department and State Division of Water Resources, I know that many of the State employees also tend to view the private engineer with some suspicion and resentment.

"It may be that reaching a better understanding with the California State Employees Association could help in reducing resistance to award of highway work to private engineering firms."*

In Oregon

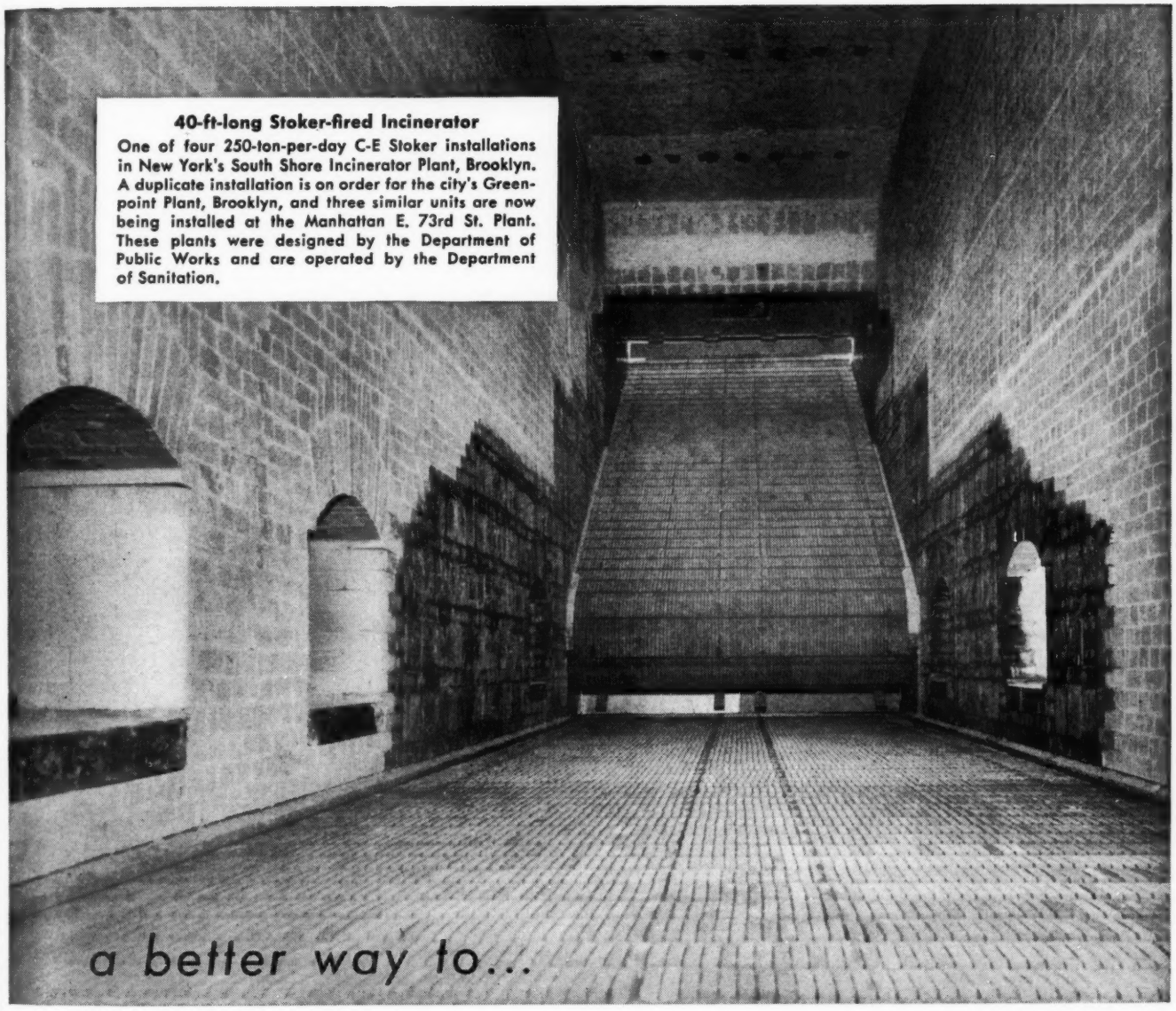
An interesting comment on engineering work for the Federal highway program comes from James K. Balzhiser, Balzhiser Engineering, Eugene, Ore. "My particular practice is devoted almost exclusively to mechanical and electrical design in the industrial and commercial fields. We do not do any structural or civil work and therefore have not made any attempt to secure work from the highway program. However, I have talked with other engineers in this area who are equipped to do highway work, and they are very serious in their criticism of the Federal highway program for not making use of engineering firms.

"We have done a considerable amount of work for the State of Oregon and the county within the scope of our specialized field, including schools, correctional institutions, and office buildings. Relations in connection with these undertakings have been very satisfactory."

No Work Available

R. Evan Kennedy, structural engineer with Edmundson and Kochendoerfer, architects and engineers, Portland, Ore., advises that as far as he knows not a single consulting firm has been retained by the State for highway work. "I believe that this is due to the fact that the Oregon State Highway Commission feels that it is well qualified and set up to handle all the engineering re-

*It is interesting to note that none of these consultants mentions the fact that the California Constitution forbids the use of consulting engineers, requiring that all engineering work for the State be done by State employees. An attempt to change this by popular vote for a constitutional amendment failed last year. California is the only State with a law of this type.



40-ft-long Stoker-fired Incinerator
One of four 250-ton-per-day C-E Stoker installations in New York's South Shore Incinerator Plant, Brooklyn. A duplicate installation is on order for the city's Greenpoint Plant, Brooklyn, and three similar units are now being installed at the Manhattan E. 73rd St. Plant. These plants were designed by the Department of Public Works and are operated by the Department of Sanitation.

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REFUSE – its a big problem for cities and for industries, too. Usually, the best way to get rid of it is to burn it. That's what New York City does – using enormous stokers like the two shown in the incinerator furnace above, which can burn nearly two hundred and fifty tons of garbage and all kinds of refuse a day.

Four C-E stoker-fired incinerators like this went to work in the vast New York refuse disposal system two years ago. Since then, seven similar units have been ordered.

These stokers are specially designed to meet a special problem. But stoker units like this can burn mountains of *industrial* wastes, too. Moreover, combined with a waste heat boiler, they can be used to generate steam for space heating or process work.

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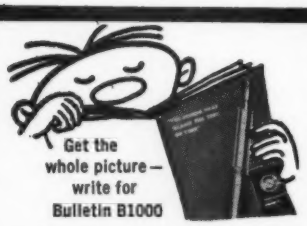
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quired for implementing the Federal highway program within this State.

"The State of Oregon claims they are not behind any appreciable amount in their construction schedule. I do not know what the Federal government would say about this claim, but I have a slight feeling that the claim is somewhat exaggerated.

"We are not now set up to do any highway work. However, if it were known by this office that highway work would be available to consulting engineers, it is very likely that we would organize so that we could at least handle bridges, exchanges, overpasses, and similar jobs where a structure is needed for the highway.

"It is certainly true that few consulting engineers in the Northwest have much experience with highway work and therefore their work may need checking by the state agencies. The reason is that there are very few firms or engineers available who have had extensive work in a highway department except within a state organization. I would think that after a few jobs, perhaps after the first one, there would be much less checking required by the state organization than they may now envision.

"We have done some work for the City of Portland but nothing in the county. I understand the county does let out some consulting work, but they also do a good share of their own. On the other hand, Portland does very little of its own work except for street and sewer maintenance, and water supply engineering of a minor nature, leaving the remainder to the field of consultants both in the architectural and engineering aspects."

Idaho Has Contracted

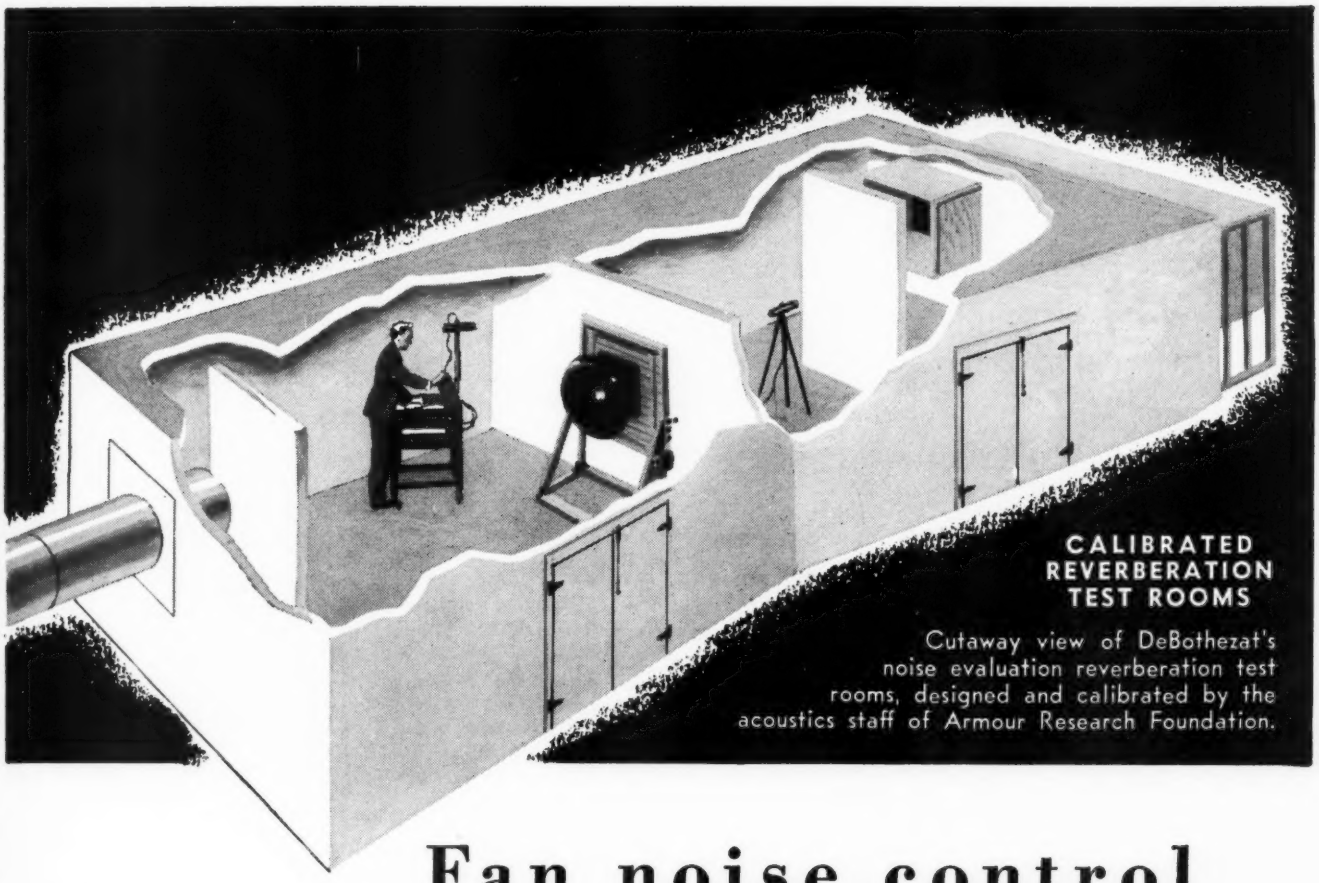
Another prominent engineer, whose firm operates extensively in Oregon, Washington, and Idaho, advises that only the State of Idaho has actually contracted for outside service on any of the Federal highway program projects. He pointed out that Oregon is in pretty good shape as far as getting the work started as it has just completed a $20,000,000 improvement program financed by the State, and therefore an organization was available to work on the Federal program. He reported that in Oregon the State law requires the State Highway Department to perform design work on bridges for counties at cost. Some engineering work has been done by this firm on county roads in Idaho under contract with the Idaho State Highway Department. It is expected that a considerable portion of Federal highway program design work in this State will be done by private consultants.

Soil Mechanics

William Enkeboll, partner in Dames and Moore, soil mechanics engineers, Seattle, Wash., in commenting on the question, said that his views applied particularly to the State of Washington, and that they did not necessarily reflect the views of other partners in the firm with respect to the experiences in the states in which they operate. The firm specializes in soil mechanics engineering and does not undertake the design of complete projects. He said, however, "We do offer soil mechanics engineering service as it is applied to highway design and construction, but we have not done any work for the Washington Highway Department, and to my knowledge, no office in our firm has done any work for any state highway department.

"With respect to counties in the State of Washington, some engage private consultants to prepare plans for bridges on county roads, but I know of no county that has engaged a private consulting firm to do any design work for road systems themselves. Dames and Moore has performed a few soil investigations for county road bridges in the State.

"We just have received our first soils investigation for a munici-



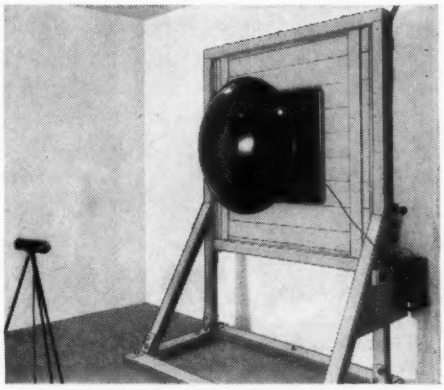
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pality in the State of Washington. In general, the larger municipalities have been quite reluctant to let out any of their engineering work. There is a trend toward letting out some forms of design. This is apparently due to the inability of the municipalities to obtain qualified engineers on their own staffs to plan and design the work in the required length of time. This is true for street improvements such as the design of overpasses and interchanges. The design of sewage works and sewage systems also is being let out to private consulting firms.

"We have obtained most of our engineering work from governmental agencies outside of the Federal government — from Port Districts. While the Port Districts usually have their own engineering staff, they have not attempted to handle their own soils engineering work, nor have they had the other State or municipal organizations, which do have soils engineering departments, handle any of their soils work.

Meetings to be Held

"The Consulting Engineers Association of Washington has arranged meetings with State Highway Department officials to discuss the possible letting out of highway design work to private consultants. It is my understanding from these conferences that the only portion of the interstate highway system that would require engaging private consultants is that section of the proposed Tacoma to Everett freeway that would lie approximately within the city limits of Seattle. I understand that the State Highway Department plans to handle all design work on the other portions of the interstate highway system in Washington. Beginning of engineering work on the section of the freeway in the city limits of Seattle is being held up pending a decision on the number of lanes for which the system should be designed. Once a decision has been made, I understand that at least some portions of the design and soil studies will be let out to private consulting engineering firms."

Determining Hourly Rates

Accounting was the subject of a recent Los Angeles meeting of CEAC. One member, whose firm is composed of four partners, showed how the firm arrived at direct costs and overhead. The results revealed that until the hourly rate is 2.06 times the salary rate there is no profit. Salaries of the principals of the firm are included in the figures.

Direct Costs

Base Wage	1.0000
Holiday & Vacations	0.0700
Insurance Programs	0.0150
FOAB & CUI	0.0525
Liability Insurance	0.0200
Workmen's Compensation	0.0058
Miscellaneous Benefits	0.0200
Total Direct Labor Cost	1.1833

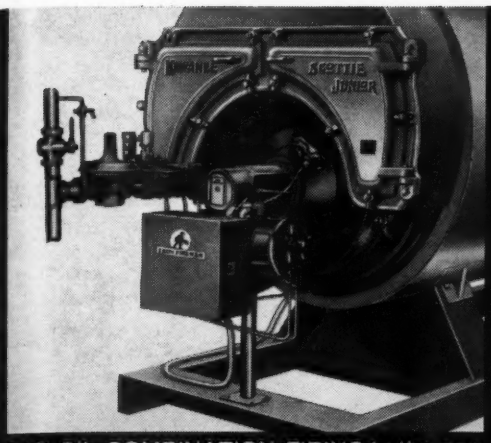
General Overhead & Administration Based on Total Direct Labor

Accounting	0.0275
Dues & Entertainment	0.0455
Auto	0.0447
Bad Debts	0.0080
Depreciation	0.0127
Office Salary	0.0715
Administration	0.1785
Sales	0.1160
Supervision	0.0625
Rent & Utilities	0.0820
Telephone	0.0197
Taxes & License	0.0054
Travel	0.0402
Insurance & Interest	0.0116
Miscellaneous	0.0178
	0.7436

1.744 x 1.1833 = 2.06 Total Cost

Architects Agree

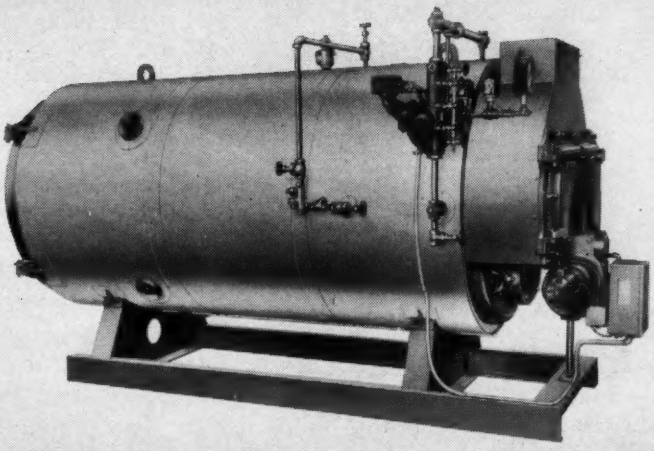
At its midyear meeting at Carmel, the California Council, American Institute of Architects, took action of considerable interest to engineers. The resolution reads, "The CCAIA does not consider competitive bidding an appropriate means for selection of engineers by architects." ▲▲

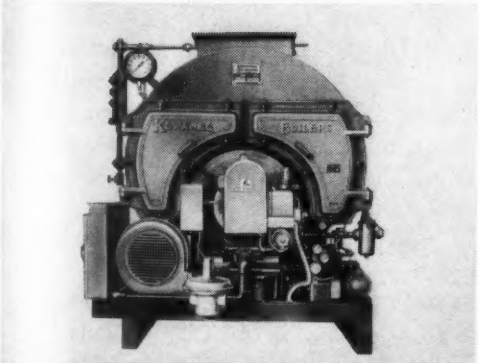


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Patent Attorney

The Powers of Municipal Corporations

The most important point to keep in mind in dealing with a municipal corporation is that its powers are strictly limited. Unlike the state government, which has all the powers of any government minus those it has delegated to the Federal Government (in other words, a continuum of power, rather than a set of discrete powers), a municipal corporation has only those specific powers that the state has delegated to it in the municipal charter or in the general statutes of the state relating to municipal corporations. If a particular power is not expressly or impliedly granted the municipality by charter or statute, the municipality simply does not have that power even if it thinks it does. Failure to recognize this simple principle is like overlooking a decimal point; it may be catastrophic.

It also should be kept in mind that not all municipalities in the same state necessarily have the same powers. A state is not permitted to indulge in class legislation, i.e. singling out a particular individual or group without reason and passing a law applying solely to him or it. This rule is evaded easily, however, by passing laws that may, for example, apply only to cities with more than a half million population, when there is only one such city in the state. As a matter of fact, it is quite common for the state statutes to provide for a number of such classifications based on area or population. Then all municipalities in one classification have the same powers, but these differ from the powers of municipalities in other classifications. Thus, it is not always safe to reason by analogy as to the corporate powers of a city.

The Power to Regulate

Like a branch of the state government, a municipal corporation has certain regulatory powers. A portion of the state's police power is delegated to the municipality. This power involves the adoption and enforcement of ordinances reasonably necessary to public health, safety, welfare, or morals.

In one sense ordinances are not laws any more than corporate bylaws are laws. Thus, it is sometimes said that the violation of a municipal ordinance is not a crime, even though it is punishable by imprisonment or fine. This point of view is in agreement with the rule that there may be double punishment, without involving double jeopardy, if a single act simultaneously violates both a state law and a municipal ordinance. However, for most purposes it is perfectly correct to regard municipal ordinances as laws.

Thus, where a contract refers to "requirements fixed by law," this is interpreted to include municipal ordinances. And where an ordinance is too vague and indefinite to be understood clearly, it is held to be invalid, in accordance with the constitutional rule requiring criminal laws to state the offense clearly. Similarly, an ordinance may be held to be invalid on the ground that it is unreasonable and hence is a violation of due process of the law.

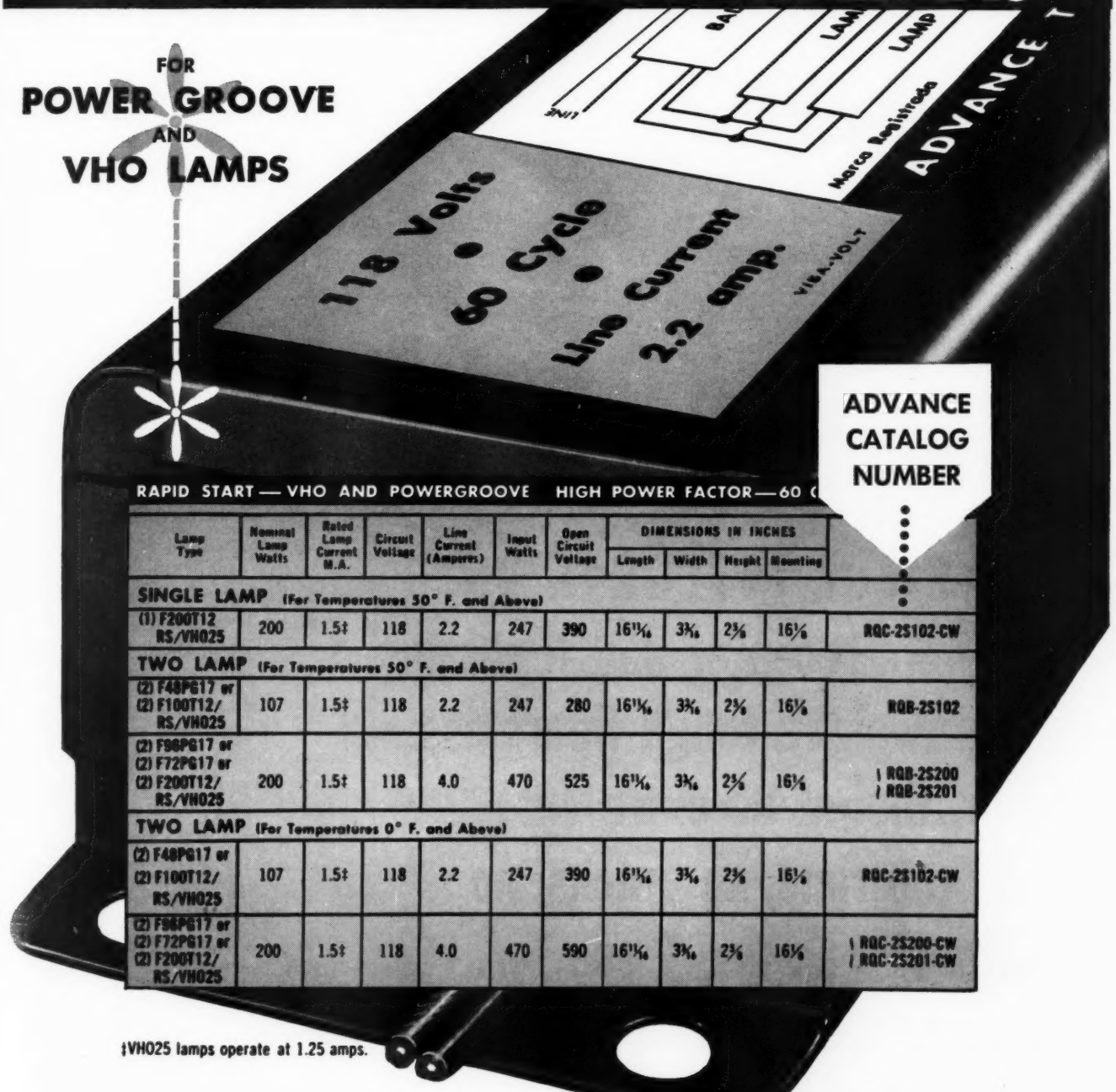
Under its police power, municipal corporations exercise the right to regulate traffic, to make various health and safety regulations, to adopt building codes, to prohibit and abate public nuisances, to adopt zoning laws, and to adopt master plans for the development of the community. All of these are very important to the engineer.

An example of current importance is the Oklahoma case of Dowell v. City of Tulsa, 273 Pac. (2d) 859, decided June 15, 1954, involving an ordinance providing for the fluoridation of the City of Tulsa's water supply — an ordinance with teeth in it, one might say. The ordinance was attacked on each of the following grounds:

¶ It constituted an unwarranted exercise of the police power in violation of the due process clause of the Constitution, in that such a regulation was

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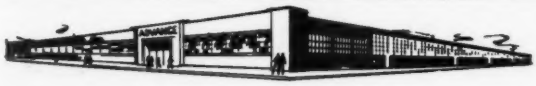
Lamp Type	Nominal Lamp Watts	Rated Lamp Current M.A.	Circuit Voltage	Line Current (Amperes)	Input Watts	Open Circuit Voltage	DIMENSIONS IN INCHES Length	Width	Height	Mounting	
SINGLE LAMP (For Temperatures 50° F. and Above)											
(1) F200T12 RS/VHO25	200	1.5‡	118	2.2	247	390	16 1/16	3 1/16	2 3/16	16 1/16	RQC-2S102-CW
TWO LAMP (For Temperatures 50° F. and Above)											
(2) F48PG17 or (2) F100T12/ RS/VHO25	107	1.5‡	118	2.2	247	280	16 1/16	3 1/16	2 3/16	16 1/16	RQB-2S102
(2) F96PG17 or (2) F72PG17 or (2) F200T12/ RS/VHO25	200	1.5‡	118	4.0	470	525	16 1/16	3 1/16	2 3/16	16 1/16	RQB-2S200 / RQB-2S201
TWO LAMP (For Temperatures 0° F. and Above)											
(2) F48PG17 or (2) F100T12/ RS/VHO25	107	1.5‡	118	2.2	247	390	16 1/16	3 1/16	2 3/16	16 1/16	RQC-2S102-CW
(2) F96PG17 or (2) F72PG17 or (2) F200T12/ RS/VHO25	200	1.5‡	118	4.0	470	590	16 1/16	3 1/16	2 3/16	16 1/16	RQC-2S200-CW / RQC-2S201-CW

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not reasonably necessary for public health.

¶ It was invalid as an undue delegation of power to the City by the legislature.

¶ It violated the First Amendment concerning freedom of religion (not the "tooth for a tooth" concept of religion, but the religious views of certain people against using medicines).

¶ It violated an Oklahoma statute forbidding the manufacture and sale of "food" to which fluorine compounds have been added.

¶ It violated the statutory prohibition of the unlicensed practice of dentistry.

This all goes to show how wrong some people can be. None of these objections was upheld, and the ordinance was sustained.

Power to Make Improvements

Municipal corporations have the power to levy taxes and make special assessments for public purposes and to spend money for such purposes. They also have the right of eminent domain, i.e. they may take property for public use upon payment of just compensation. But what is a "public purpose?" Borderline cases, on which there is a conflict of authority, include advertising the city, paying for a fireworks display on July 4, and reimbursing a municipal officer for expenses incurred in defending a lawsuit brought against him for an act done in his official capacity.

A similar question is involved in making special assessments for local improvements such as grading or paving a street or constructing a sidewalk. The assessment is made in an ordinance. Before adoption of the ordinance, individuals to be assessed are given notice and an opportunity to object at a hearing. The objection may be that the individual gets no special benefit out of the improvement or that the apportionment between the city's share of the cost and his assessment does not reflect fairly the relative extent of his special benefit.

The expenditure of municipal money for public housing and urban redevelopment programs frequently has been attacked by taxpayers, and the taking of the property by eminent domain very often is attacked by the owner of the property. Nevertheless, such ordinances generally are upheld.

Power to Provide Services

Statutes generally authorize municipalities to own, maintain, and operate electric power and lighting plants, waterworks, airports, transportation systems, and other public utilities. And when the state public utility commission fixes rates, it is considered proper for them to discriminate between public utilities operated by business corporations and those operated by municipal corporations.

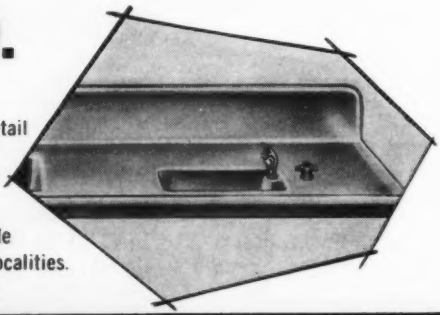
Municipalities generally have the power to provide such public services as bridges, sewerage sys-



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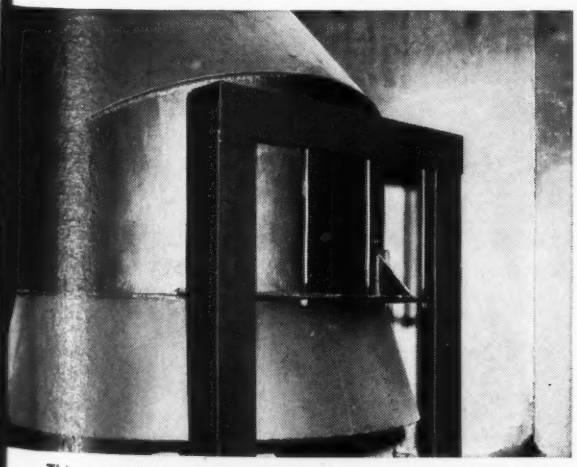


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tems, and parks and playgrounds.

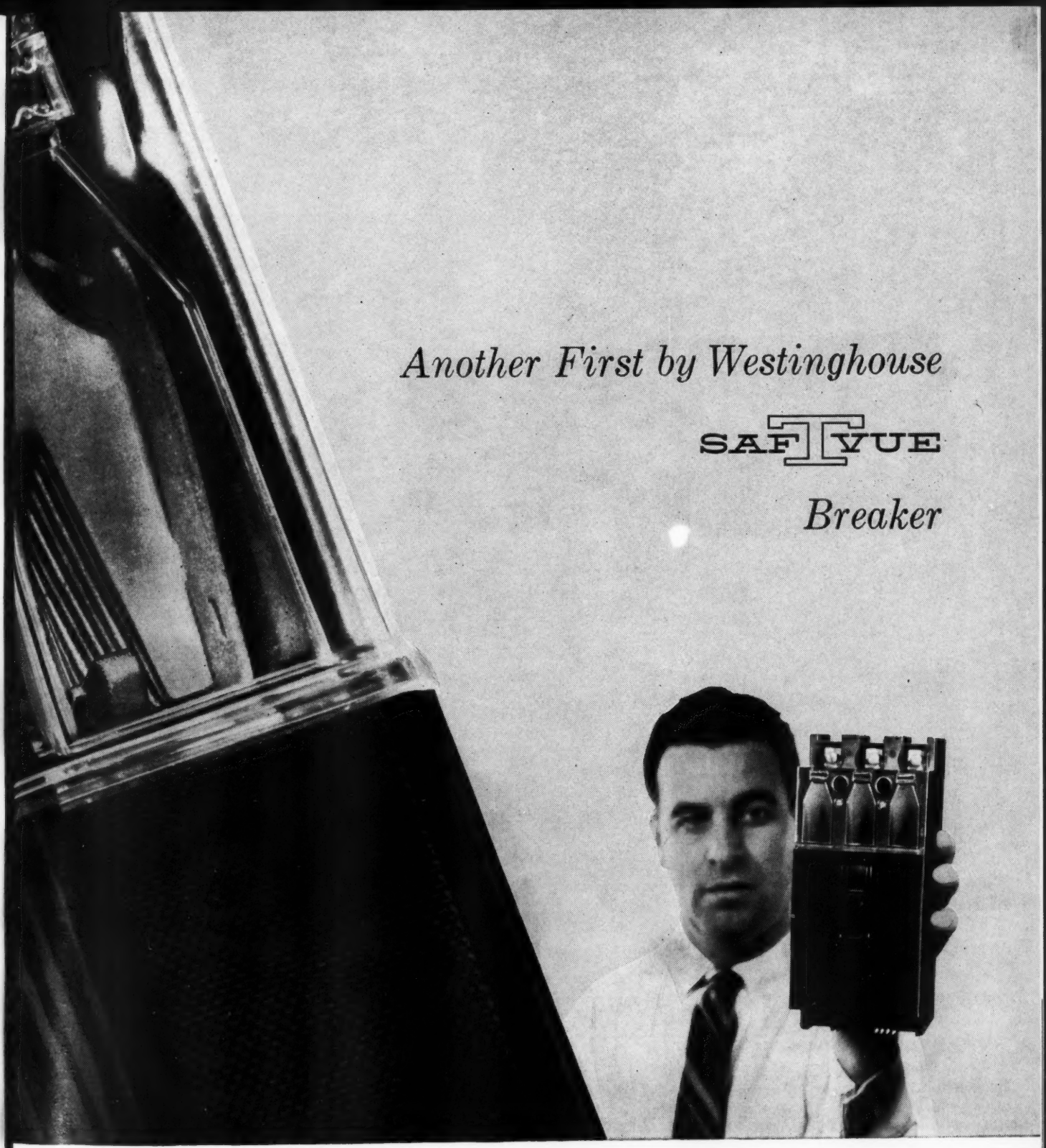
The control of streets and traffic is undoubtedly one of the most important of all municipal functions and results in a great volume of litigation every month. Typical of the legal problems that arise in this area have to do with whether or not certain property has been dedicated for public use as a street; how much the city should pay when it takes property to widen a street; whether the city should pay damages to neighboring landowners when a limited access highway is built blocking their egress in one direction; tort liability of the city for failure to maintain streets in safe condition or for injuries caused by defects in sidewalks or caused by snow and ice piled up along the roadways by the city's plows.

Power to Enter into Contracts

A municipal corporation has power to enter into contracts that are necessary and proper to achieve the purpose for which it was created. It is liable on contracts whether it signs as a government or as an owner, providing the contracts are within the municipality's power to make.

Statutes frequently prescribe certain methods of letting contracts for public works, including advertising for bids and letting the contract to the lowest bidder. Statutes frequently prohibit a city official from contracting with the city. In these instances failure to abide by the requirements results in a contract that is absolutely void. No recovery can be had against the municipal corporation on a contract basis, and recovery on a quasi-contractural basis also frequently is denied. Thus, it is vital for a person or company entering into a contract with a municipal corporation to make sure that the contract has been legally entered into before actually proceeding with required services.

In addition, there are generally statutes limiting the amount of indebtedness that a municipality may incur voluntarily. ▲▲



Another First by Westinghouse

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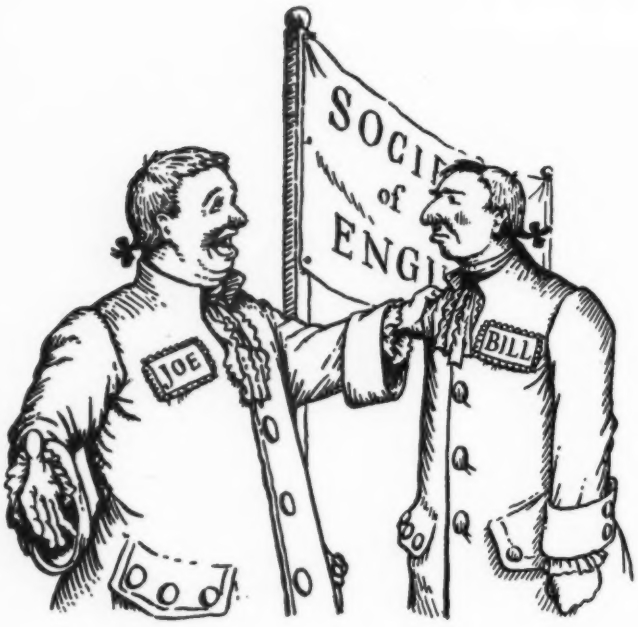
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Heard Around Headquarters

STAFF

An application for incorporation has been filed with the Department of State by the New York State Association of Consulting Engineers.

Last August, the members of the Association of Consulting Engineers of Upstate New York voted unanimously to accept a multiclaused resolution making the group the Central New York Chapter of the New York State Association.

Howard F. Eckerlin, of Syracuse, is temporary president of the State group, with James N. DeSerio, Buffalo, temporary vice-president, and Frank E. Kulas, Rochester, secretary-treasurer.

At a recent meeting of the New York Association of Consulting Engineers, it was suggested that the New York City group reconsider affiliation with the state organization.

At the November Board Meeting, Consulting Engineers Council officially adopted the letterhead design shown below for use by its members.

Complete information on the time and costs involved in modifying the insignia for use as lapel pins, decals, auto license tags, and project signs was presented at the meeting and is now available from the office of the Executive Secretary, Larry Spiller, 726 Reisch Building, Springfield, Ill.

The Secretary's office also is working on a set of rules pertaining to how, when, and where the official CEC insignia should be used.



The annual report of the American Society of Civil Engineers announces that, in an effort to forestall price bidding for professional engineering services, letters have been sent to all state highway commissions, giving appropriate procedures for selecting a consulting engineer.

The report explains that although competitive bidding has continued to be disturbing, fewer instances have been brought to the Society's attention in 1957 than in any previous year.

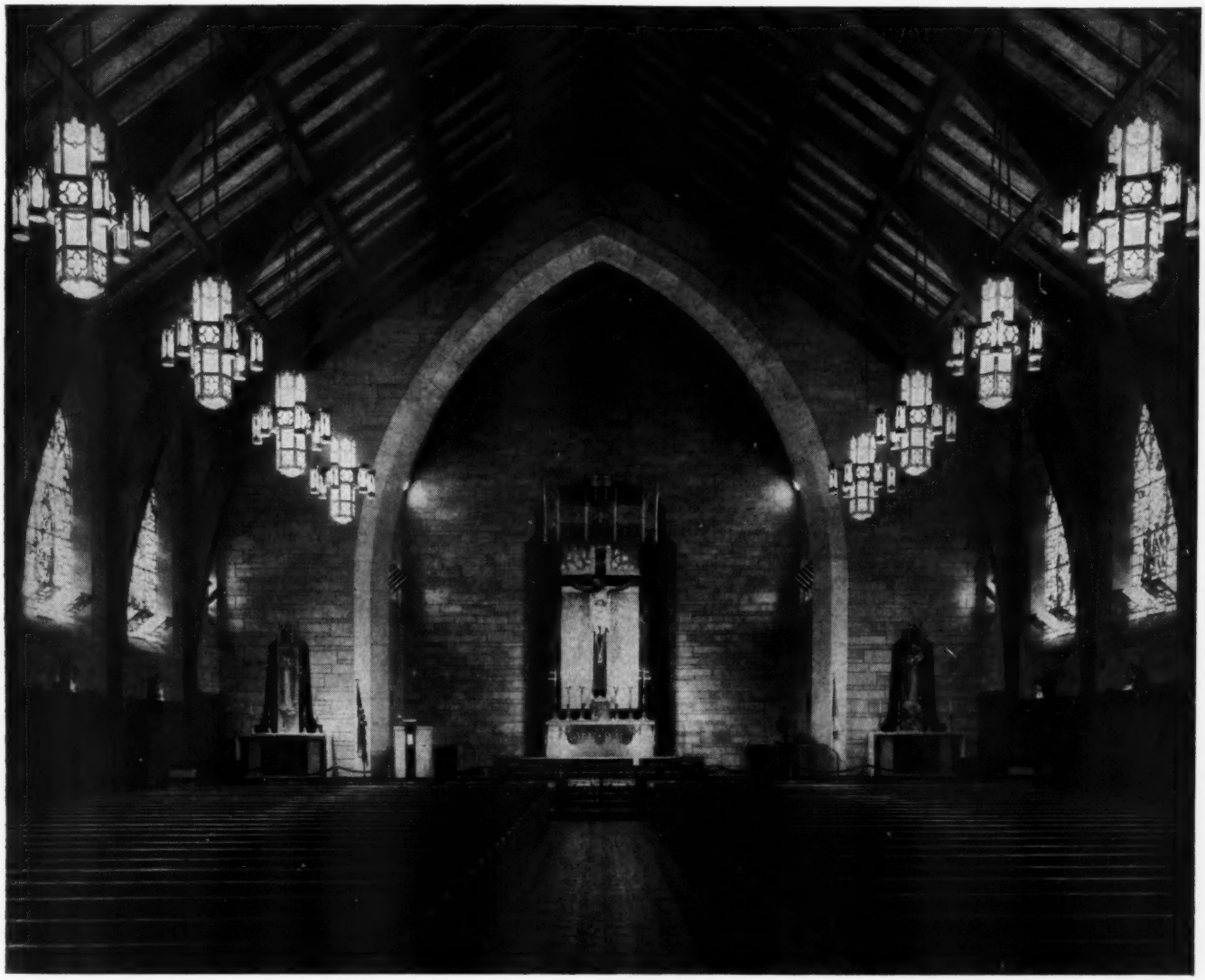
Thus, ASCE assumes there is less competitive bidding, not that fewer people are reporting it.

The report also states that an upward adjustment of fee schedules is expected, with the revision of the ASCE manual on professional practices. A standard contract, plus an agreement for engineers and architects for use when the two are working together on a project, also may be included.

Although the ASCE is considering the desirability of a special program covering "errors and omissions" insurance, there was wide diversity of opinion. It was recommended that no official stand be taken for or against sponsorship of such a policy by the Society, since this insurance now is available to responsible engineers through other groups or independently.

Utah's licensed professions — engineers, land surveyors, architects, certified public accountants, chiropodists, dentists, nurses, optometrists, osteopaths, pharmacists, physicians and surgeons, sanitarians, and veterinarians—recently combined their efforts and defeated proposed legislation that would have weakened licensing provisions.

After a two-year study, the Utah Legislative Council had suggested a number of changes in the professional licensing laws. The proposed changes included the addition of lay citizens on each board and the establishment of a super-commission as the



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Beautiful new St. Paul's Catholic Church, Princeton, N. J.

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final licensing board and board of appeal in licensing matters.

Daniel M. Schwartz, chairman of the Utah Professional Council, said his group felt that the public is best protected by having competent persons within each profession give the examinations to their respective groups, "without the possibility of having such determinations overruled by persons not competent in the profession." He added that the addition of lay members to professional examining boards also would seriously affect reciprocity with other States."

". . . And such lay members would serve no useful purpose," he summarized.

The Utah Engineering Council, incorporated in 1948 by representatives of eight engineering organizations, recognized the problem and spearheaded the joint action by the licensed professions.

Schwartz said that the effective work of the professional group in defeating the proposed legislation has indicated the effectiveness of a permanent organization which could improve ethical standards, increase interest in professional education, and gain more effective public relations.

Ambitious plans for the new engineering headquarters building, to be built near the United Nations building in New York City, were unveiled Nov. 21st at the Waldorf to a selected 100 presidents and board chairmen of industries that have indicated an interest in contributing toward the new structure.

An impressive list of fund campaign leaders also was revealed, with Herbert Hoover, dean of engineers, named as honorary chairman for the fund drive.

Sharing the head table with Mr. Hoover were Alfred P. Sloan Jr., honorary vice-chairman; John J. McCloy, chairman of the board of Chase-Manhattan Bank, campaign treasurer; and Dr. Mervin J. Kelly, president of Bell Telephone Laboratories, general chairman. Donald Quarles, assistant secretary of defense, also was among the honor guests.

Goal of the campaign drive is $5 million to be contributed by industry, with $3 million coming from members of tenant engineering organizations. The remaining $2 million will come from United Engineering Trustees Inc. This figure will include proceeds from sale of the present headquarters.

Because the criteria for the recognition of an engineers' professional status varies considerably from one nation to another, the EUSEC Conference on Engineering Education and Training, (Paris, September 1957) has compiled an official definition.

The report, being printed by the Institution of Mechanical Engineers of Great Britain, will be distributed at the EUSEC meeting in New York City next Spring.

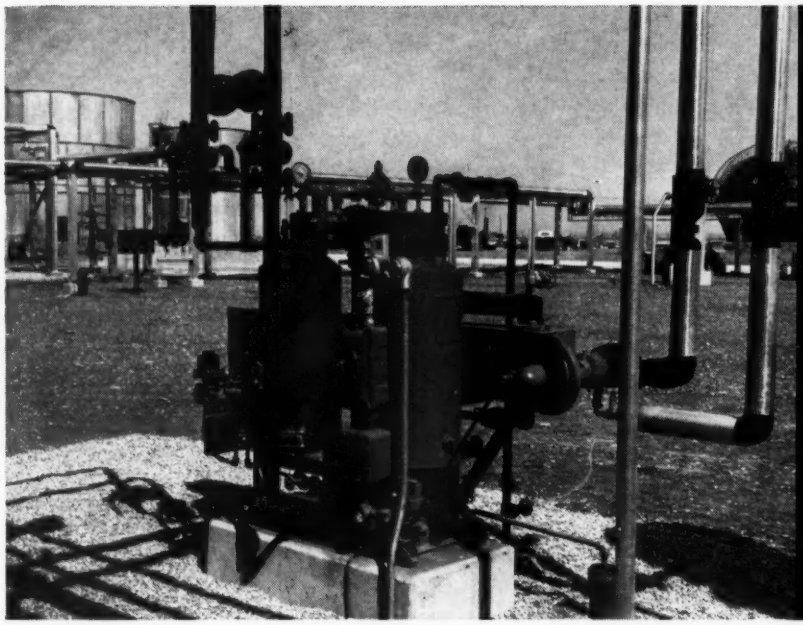
(EUSEC is an organization of engineering societies of Western Europe, Canada, and the United States. An English translation does not fit the letters as listed in the abbreviation.)

The definition, compiled after member nations submitted reports of what "professional engineer" meant in each nation, is:

"A professional engineer is competent by virtue of his fundamental education and training to apply the scientific method and outlook to the solution of problems, and to assume personal responsibility for the development and application of engineering science and techniques, especially in research, designing, manufacturing, superintending, and managing. His work is predominantly intellectual and varies, and not of a routine mental or physical character, but requires the exercise of original thought and, if necessary, the responsibility for supervising the technical and administrative work of others.

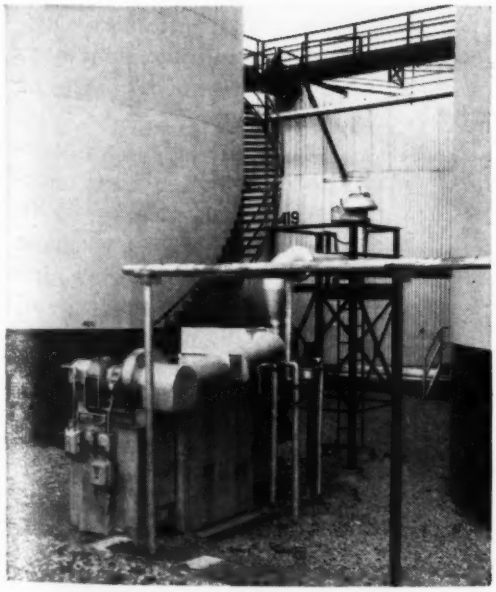
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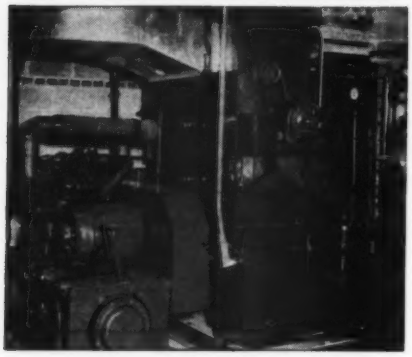
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"By virtue of his education and training, he will have acquired a broad and general appreciation of the engineering sciences as well as a thorough insight into the special features of his own branch, with the result that in due time he can give authoritative technical advice, or be responsible for the direction of important tasks in his branch."

And that's what a professional engineer is, according to EUSEC.

Temporary officers for a consulting engineers functional group of the New Jersey Society of Professional Engineers will be elected at a dinner meeting Dec. 6 at the Newark Athletic Club.

An organizational meeting, held last month, was attended by 19 persons. Joseph Rosenthal, president of Engineers Inc., Newark, was named temporary chairman.

The officers, selected this month, will serve until the NJSPE annual meeting in May.

Rosenthal pointed out that New Jersey consulting engineers have no organization at this time, and said that he felt that a functional section (with the backing of all the professional engineers in the state) will be much more effective than an association of consulting engineers could be, with its influence limited by the number of members.

After more than two years of study, the National Society of Professional Engineers ethical practices committee has published a detailed explanation of the Canons of Ethics.

The 27 points in the Canons now are clarified by 61 rules. "Free engineering" appears several times in the rules, and engineers are cautioned against it. The new ethics booklet also explains just where the line between good public relations and poor ethics lies in advertising.

According to the rules, an engineer can let the world know he is available, as long as the advertising is circumspect and placed in media that is dignified and reputable. The rules caution engineers against allowing themselves to be listed for employment in ads that exaggerate their qualifications.

The engineer also "will not accept financial or other considerations, including free engineering designs, from material or equipment suppliers for specifying their products." And he will not represent plans, designs, or specifications given him by a manufacturer or supplier of equipment as his own work.

"If in sales employ, he will not offer, or give engineering consultation, or designs, or advice other than specifically applying to the operation of the equipment being sold," Rule 56 adds.

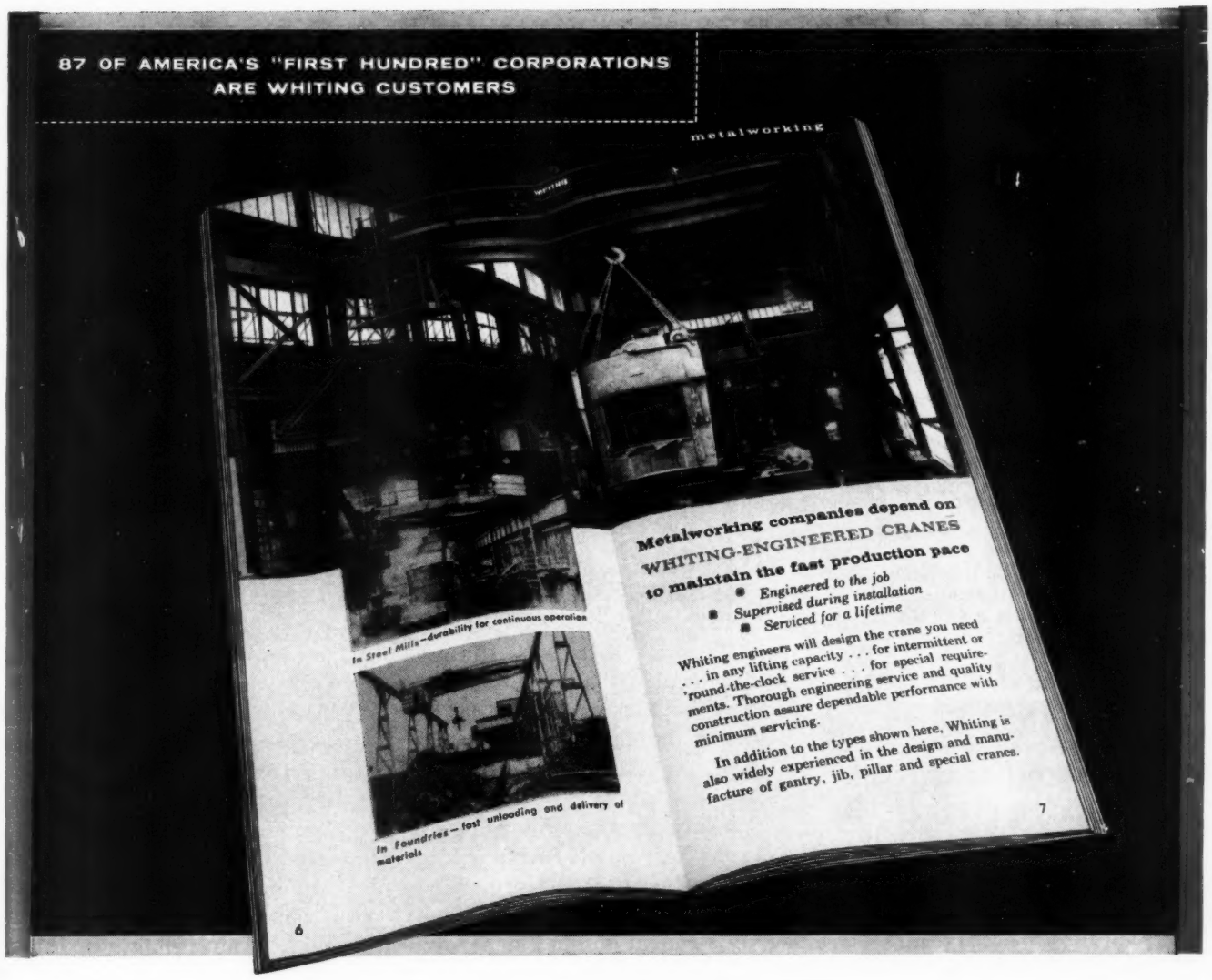
For employers, the rules say he must assign professional engineers to duties utilizing their full training and experience insofar as possible, and delegate lesser functions to subprofessionals or to technicians. The employer also must not attempt to hire engineers away from other employers by offering unjustified salaries or unwarranted benefits.

The rules, under "miscellaneous," also state that any firm offering engineering services must, in conformance with state laws, have its operations under the direction and responsibility of registered professional engineers.

For some time, engineering organizations throughout the country have been watching a labor situation that started in the Buffalo plant of Westinghouse.

In the past, the National Labor Relations Board has included nonprofessionals in voting units when the group was "predominantly" composed of professional employees. The test came when

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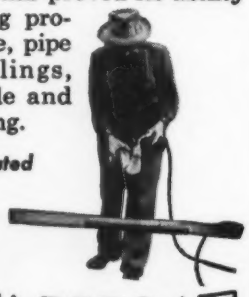
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the NLRB ordered an election in a Buffalo unit containing 233 professional employees and nine nonprofessionals.

A panel of three judges, in the United States Court of Appeals for the District of Columbia, recently decided unanimously that if professionals want to exclude nonprofessionals from their bargaining groups, the NLRB cannot order them to do otherwise.

The National Society of Professional Engineers, which acted as a "friend of the Court" throughout the district and appeals court levels, reported that the NLRB may carry the case to the Supreme Court.

The NSPE brief particularly cited the danger in the "predominantly professional" theory, which could result in nonprofessionals controlling the voting results of the entire group.

The Appeals Court decision stated that:

"It is clear that this provision (in the Taft-Hartley Act) was intended to protect the professionals; that the professionals' right to this benefit does not depend on Board discretion or expertise; and that denial of this right must be deemed to result in injury. Thus this case presents Board violation of a statutory requirement and resulting injury."

A committee on Improved Professional Relations, reporting to the NSPE board at a recent meeting in Bismarck, N.D., stated:

¶ NSPE continues to favor unity of the engineering profession.

¶ Due to the rapidly changing status of Engineers Joint Council, the committee is reopening its study on the advisability of NSPE joining EJC.

¶ The committee proposes to send a questionnaire to all member state societies getting their views on unity.

The committee had been asked to study a report, given by the Inter-Society Relations Committee, at the annual NSPE meeting last spring. The Inter-Society group had favored the unity proposal as set forth by the American Institute of Electrical Engineers. The Committee also had recommended that NSPE (1) reexamine its admission requirements so as to expand membership, and (2) again give consideration to joining EJC.

The Bismarck report made no mention of re-examining NSPE admission requirements.

The New York Federal Court, in a ruling that might affect funds left to some engineering societies, decided, on a suit to recover estate taxes, that nearly $2 million given to city, county, and state bar associations, did not represent valid deductions.

The court ruled that the bar groups were not organized exclusively for charitable, scientific, literary, or educational purposes, noting that one of their aims was to try to influence legislation.

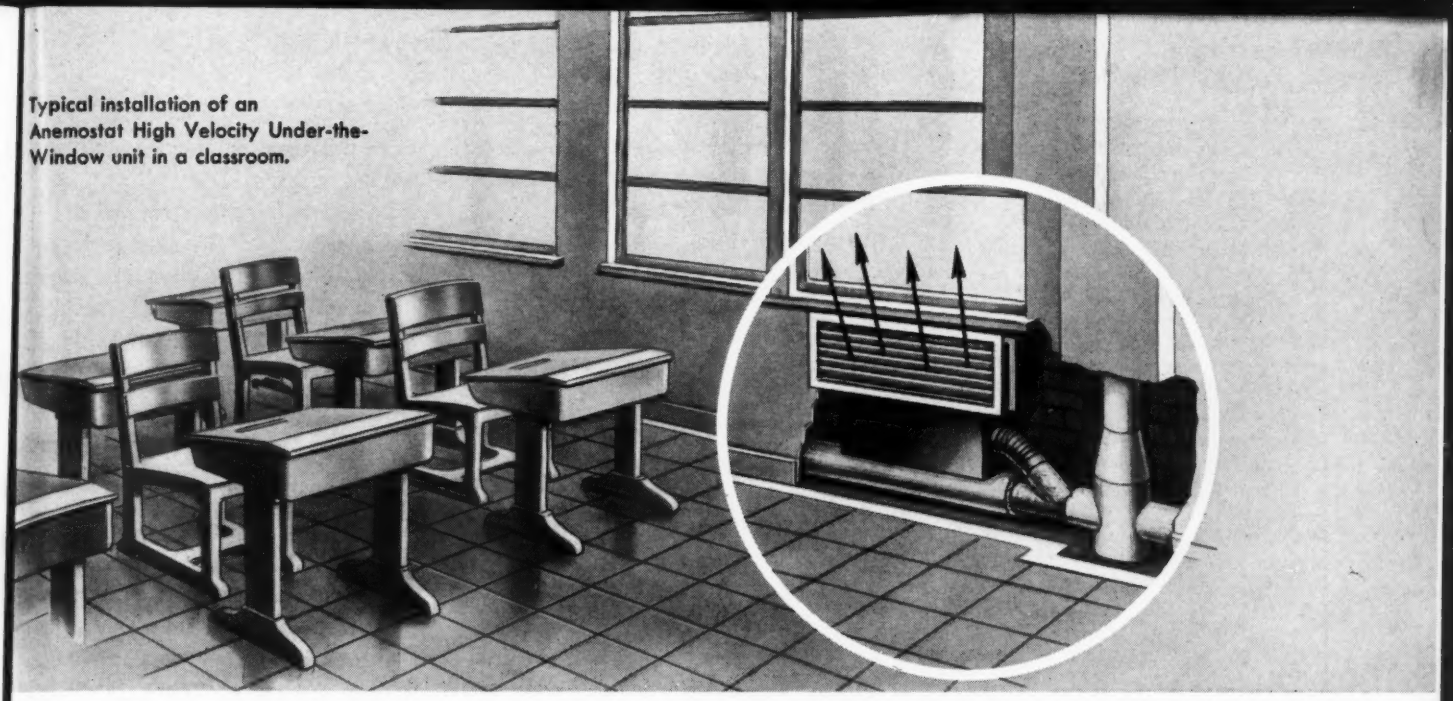
Though the disqualified grants were reallocated to Columbia University by the executors, the court still would not allow them as deductible. The ruling was based on an established opinion that when executors have the optional discretion of diverting bequests from charitable to noncharitable recipients, deductions must be denied whether that choice is exercised or not.

Three new consulting engineer associations are in the formative stages at the present time.

In Columbia, an Association of Consulting Engineers of South Carolina was formed recently. At present, primary efforts are towards increasing the membership.

Temporary officers are R. C. Johnson, president; G. H. Rowe, vice-president; and Gerald H. Preacher, secretary-treasurer.

In Pittsburgh, a group of 30 consulting engineers hopes to be organized early in the year. At this time, bylaws are being prepared and the consultants plan to incorporate as a nonprofit organization. The Pittsburgh organiza-



Typical installation of an Anemostat High Velocity Under-the-Window unit in a classroom.

How to deliver high velocity air to schoolrooms

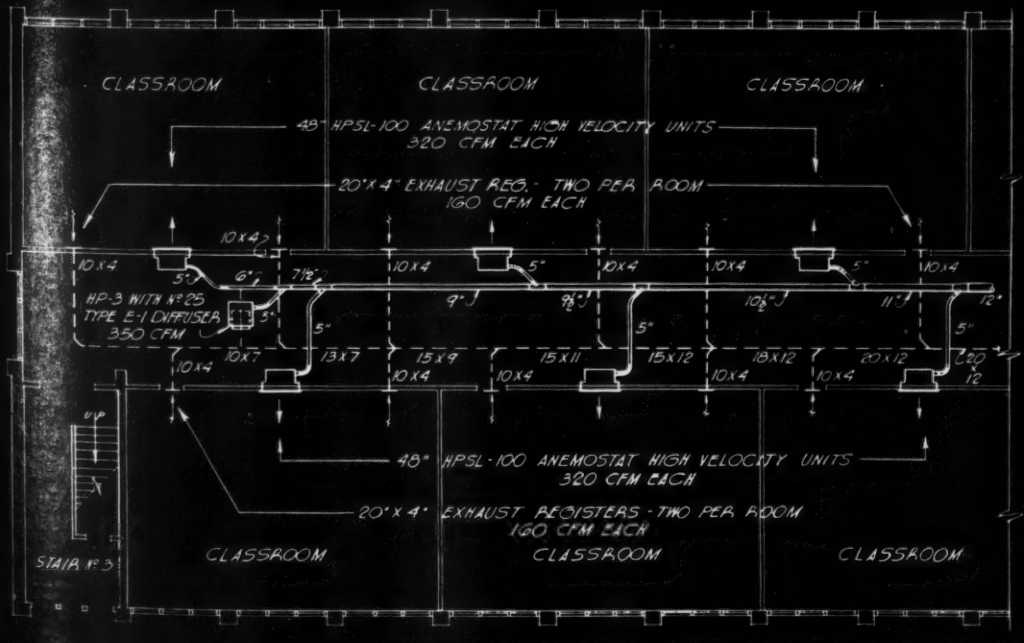
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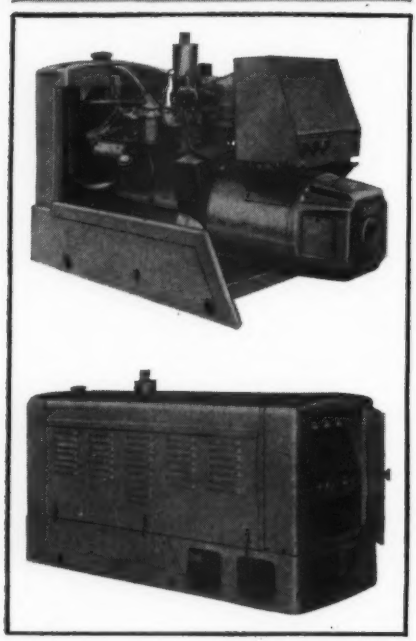




Diagrammatic layout shows corridor distribution of high velocity air for wing of school.

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tion, at this time, is limited to consultants who act as subcontractors to architects. To date, no discussion has been held as to whether the group plans to apply for admission into the CEC.

The temporary steering committee includes Theodore F. Rockwell, chairman, with James A. Murray, Lawrence W. Hornfeck, Martin C. Knabe, Edward T. Wiesmann, and Robert A. Zern.

Fifty firms representing 600 engineers recently formed the Cleveland Consulting Engineers Association. Membership is open to registered professional engineers in private practice with no affiliation with a manufacturing, service, or construction firm.

Steering its affairs is the following executive committee: George F. Evans, chairman; David V. Lewin, vice chairman; Nathan N. Hoffman, secretary; Paul C. Mehnert, treasurer; Floyd H. Valentine, member-at-large. Standing committee chairmen are Thomas E. Terry, membership; David E. Pfitzenmaier, fees; and Homer T. Borton, ethics.

Personal record forms now are being mailed to engineers who are prospects for inclusion in the next edition of "Who's Who in Engineering."

A committee, acting under guidance of Engineers Joint Council, has decided that the past requirements for inclusion in the engineering "Who's Who" are sufficient and do not need revision.

To be listed, an engineer must have at least ten years of active practice, including at least five years in responsible charge. For teachers, the ten years must include five years in responsible charge of a major course in colleges of acceptable standards.

Military experience will receive "proper consideration" toward the required time in active practice or teaching, and the committee also pointed out that engineers whose jobs have become increasingly administrative also will be given the same consideration as if their positions still consisted primarily of engineering.

To get a personal record form, write to E. N. Dodge, Editor, *Who's Who in Engineering*, Lewis Historical Publishing Co. Inc., 265 West 14th St., New York 11, N. Y.

The American Institute of Architects has approved the establishment of a joint "trouble shooters" committee with EJC.

The purpose of the joint body will be to discuss any problems that may arise that affect the two organizations and their members. The two groups agreed that such a committee should be established and working, so any specific problems developing in the future can be handled quickly and efficiently.

The formation of the committee was approved by the EJC board in January, and the approval of AIA was announced last month.

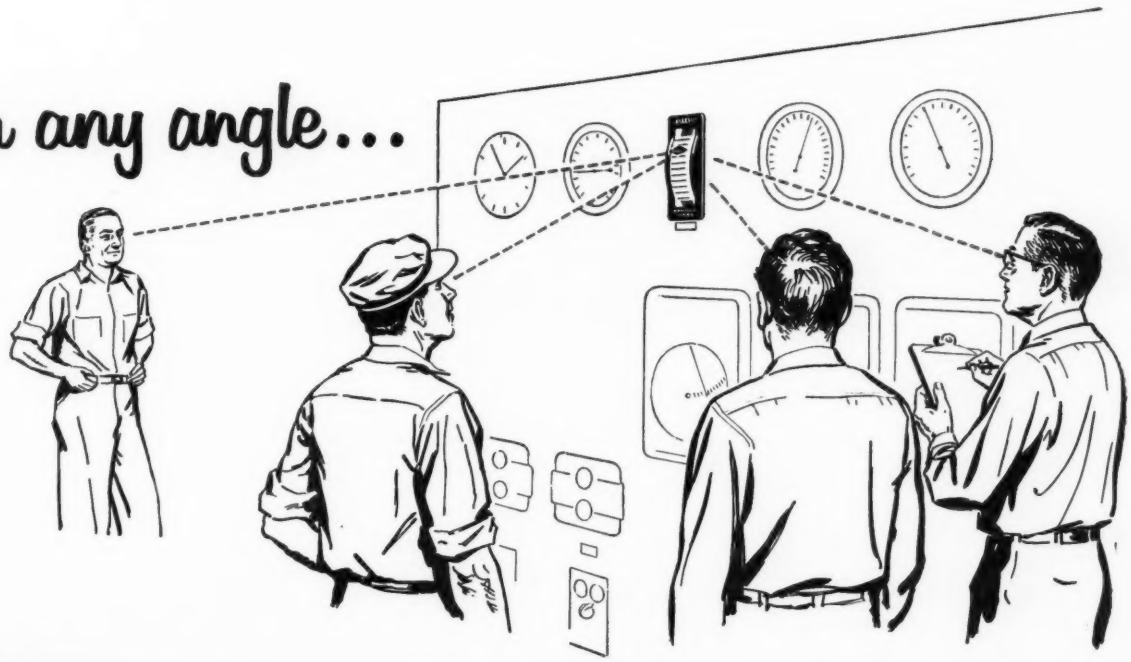
This is the first time EJC and AIA have had a joint committee.

Among the sponsors of the Nuclear Congress, to be held in Chicago next March, will be the Atomic Industrial Forum Inc., which also has announced that the annual Atomic Energy Management Conference and the "Atom Fair" will be held in conjunction with the Nuclear Congress. This will mark the first time the Atomic Forum has taken a major part in the Congress and also will be the first time the Atom Fair and Management Conference have been scheduled to coincide with the Congress.

More than 30 engineering and scientific organizations will take part in the Nuclear Congress, and more than 200 technical papers already have been scheduled.

The Management Conference, sponsored jointly by the Forum and the National Industrial Conference Board, is designed to provide management with a comprehensive review of the progress being made throughout the world in the development of low cost nuclear power and other industrial uses of atomic energy. ▲▲

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ANONYMOUS

Here is the most candid and shocking article ever published on professional ethics. For the first time an engineer tells how he has been forced to deal with commission agents and dabble in competitive bidding in order to be permitted to engage in the practice of his profession. His story may not be true for all branches of private practice nor in all parts of the country, but his story is authentic for his field of practice and also his state. We checked it.



A Prominent Engineer Confesses . . .

I Gave Up Ethics - - To Eat!

I WAS NOT AMONG those brave but foolhardy young engineers who saved or inherited a few thousand dollars and then set themselves up in private practice with nothing to support their decision but an overwhelming self-confidence and a diploma on which the ink was still fresh. Quite the contrary, I have always been a conservative, and my background was such that even today I place more faith than most in the old maxims. I believe that it takes intelligence, experience, and hard work to become a qualified engineer, and I am of the opinion that engineering is a great calling that deserves in its ranks only those who abide by its ethics.

But I also know that what should be is not always what is.

When I first entered private practice, I was well qualified. I was graduated, with high honors, from a distinguished (perhaps the most distinguished) engineering school. My teachers not only had given me a good technical education, but even had provided me a grounding in professionalism and engineering ethics. After I received my degree, I served a long apprenticeship with an old, established engineering firm. Only after I had directed many responsible jobs and had headed important projects successfully was I convinced that I could step out on my own.

Without question I was qualified technically, and I properly considered myself something of an authority on professional ethics. My special field of experience was in public works — highways, bridges, docks, sewage plants, and water works — those fields in which the client generally is some government body such as a state, county, or city. (This is important to my story, for had I gone into a branch of private practice in which architects or private owners were the clients, I might have no story to tell.)

I thought that with my background and my willingness to work, I would, before long, be making a good living from my practice.

Instead, I soon was starving.

I did not understand why, but when I went to the state and municipal agencies to see about handling some of their projects, I never seemed to be able to find the right person. They were polite, but each would explain that the final choice was not up to him. I was on a treadmill leading nowhere. For a full two years I had no work, and this was not in the depression but immediately after the War.

Then a friend of mine, an engineer, who worked for the state, tipped me off. Nobody, he explained, gets engineering work without practicing the fine art of "political engineering."

I got the idea, but I did not like it. I also did not like the idea of hunger in a land of plenty or the pile of bills that kept pyramiding on my desk.

It was then that I turned to myself and began to rationalize. I took the position that as an engineer dealing with governments, I must wear two hats and cloak myself in two separate codes of ethics. One code applied to the engineering aspects of my work, another applied to my business behavior. By the development of this schizophrenic professional personality, I could secure work under one code of

ethics and then perform it under another. I hungrily adopted this philosophy.

My lawyer introduced me to a "public relations counsel" who was supposed to be a close friend of the mayor in a small city that was planning to build a multimillion dollar housing project.

At this point, my counsel and I did not have a dollar between us after we purchased our train tickets for the trip to see the mayor. On arrival the first act required of us was to take the mayor's campaign manager to lunch. We squeezed through by drinking coffee while he dined on a hamburger.

We got to see the mayor.

"Hi, Joe. Remember me. I helped carry the first ward for you and made a few campaign contributions," my counsel said to the mayor.

"Sure, glad to take care of you. What can I do?" the mayor replied to his old friend.

I learned later that my counsel had never seen the mayor before in his life, but we got the job.

I was in business. I had my first project as a consulting engineer. My counsel received the customary 10 percent of my fee.

When getting jobs this way, I learned, you also are supposed to "do something" for the mayor. I have no way of knowing what my commission agent did. I made it a policy to give him a straight commission, and how he managed his end of the business was entirely up to him. He probably had to give the mayor most of his commission on that job.

My counsel and I had a satisfactory working relationship for a number of years.

Then there was a small misunderstanding. On one project, I was asked at the last minute to work with another consulting engineer. Naturally, my fee was only half of what I had expected, but the agent wanted 10 percent of what I would have received if I had been the only consultant on the job. He sued me, but the case was thrown out of court.

His contacts were a little limited anyhow.

I Meet "The Reverend"

Fortunately, he had introduced me to another man (I always called him "The Reverend") who was a former member of the legislature, a former mayor of a sizeable city, and currently was a lobbyist (representing, so far as I could determine, his own interests). He also considered himself a public relations counsel.

The Reverend was in pretty good with the public works department and other state agencies. On a 10 percent commission, he made about $40,000 a year from me. I even made him a vice president in my firm. The title did things for his ego although he received no salary and had nothing to say about how my practice was managed.

The Reverend had his own Code of Ethics, and he abided by it. He was so crooked that he could have worn a corkscrew for a tie-clasp, but when he worked for me, I received his undivided loyalty. His loyalty was well rewarded. I never accepted a project from another agent. I always worked through him even on a few jobs that I could have obtained in more conventional methods.

I never asked The Reverend how he made or kept his political connections. It is a criminal offense to offer a state official a bribe in order to be granted a project. I always assumed The Reverend had more sense than to do anything like that. But there are ways of showing your appreciation to the proper people without giving them money.

Sometimes I could hear him in operation on the telephone in his office. The conversation might go like this. "This is The Reverend. Has the word come in from the fat one? . . . No! . . . Has The Rabbit been up to the Capitol yet? . . . When he does, make sure he mentions the party from Hillsdale . . . Yeah, that should be enough. Call me back tonight at the Bellmont number."

The Reverend had a fascinating habit of calling all of his acquaintances by some descriptive label rather than by name. I never met any of these interesting personalities of the political world.

"Social Activities"

I know one engineer who charters planes and takes all of his "social" acquaintances to out of town boxing matches. His social circle seems to include a preponderance of state officials, especially if a large contract is in the offing. It always amuses me to see these little excursions mentioned in the social columns of our paper.

An architect of my acquaintance has a "public relations counsel" who is currently an active member of the legislature. He draws a five figure salary from the architect whether he brings in any business or not.

Many of this counsel's fellow legislative members are influential back home. For example, let's say Senator Jones has a $3-million school project back home. The counsel informs the Senator that his firm of architects is the best in the country and then reminds the Senator that he might need a few legislative votes in the future. He agrees that the Senator can have his vote on three issues that he ordinarily would have no reason to favor — that is, if the correct architects are chosen for the school.

The architects seem to be even more adept and better organized than the engineers in the fine points of "political practice."

Other people have their own formulas for paying off the officials without being so uncouth as to flash money around.

The cousin of the governor was given office space in one consultant's office — even was moved here from another state. This engineer has been getting a surprising amount of work from the state since he got his new tenant. There are other and less ob-

vious ways that can be used. Suppose our counsel hears it on good authority that a certain man could give us some business. Maybe the counsel can use his influence to get the state official a promotion, or an increase in salary — for which the official would be less than human if he did not reciprocate when the opportunity arose.

Or maybe we are doing a highway project. The Reverend knows about this, and as a result the commissioner's brother-in-law just happens to buy available land where the highway is going to be located. He could make a nice profit this way.

Campaign Contributions

Campaign contributions also play an important part in getting the more lucrative state jobs.

I always make a large contribution to both parties. Last year, I gave $10,000 to the party with the best odds, plus an insurance contribution of $2500 to the other party. All parties keep excellent records on who donates and how much.

Immediately after the elections, a list of acceptable engineers is compiled from the campaign contribution records. At one time this was a list of only five or six firms. Now all of the engineers are catching on, and the list looks like the classified section of the telephone book.

One more pointer — you have to make the contributions before elections. This seems to count more in your favor than later tokens of appreciation to the winner. This business of campaign contributions is a delicate affair.

One year we gave a close relative of the governor $20,000 for the campaign. Several contracts came up, but we were not considered for any of them. Finally, The Reverend went to the governor and asked what was wrong. He hesitantly mentioned that we neglected him during the campaign.

When The Reverend explained that we had given $20,000 to his relative, the governor refused to believe him and wanted to know if we were accusing his family of stealing. Fortunately, the relative "remembered" the $20,000 when the governor asked him about it.

From then on, we received our share of the work. Meanwhile, we had missed several large contracts.

As far as I can find out, nobody gets a government job in this state without a go-between. I have discussed this frequently with other engineers, who readily admit (off the record) that they have commission agents.

In some districts, Federal work is just as hard to come by. When you hear some engineer casually say "the Army called us in," you might find that he has a retired Army officer on his staff to insure that he receives the "call."

The Founder Societies pretend that such things as commission agents and competitive bidding are rare or do not exist. If it makes them happy to believe this officially, let them. If they acknowledged the truth, they might feel they had to do something about it.

Competitive Bidding

Once I deliberately got mixed up in competitive bidding just to see how it worked. We were invited to bid on a sewer system. The city described the job roughly, and we were to bid on a percentage design fee plus per diem rates for a survey party.

I thought sure I was the low bidder, but a large, and "reputable" firm of engineers got the bid. There must have been some political angle that I missed.

Shortly afterwards, I received another invitation to bid on a project. This time, I forwarded the letter to my Founder Society, and was informed, by letter, that complying with this invitation to bid would violate our Code of Ethics. The Society instructed me to send the mayor a letter explaining that I would be happy to discuss the project with him, if he wanted to hold the discussions to a professional instead of a price basis.

One of the leading engineering firms in the East got this job. I sent the announcement telling who was "low bidder" (clipped from a newspaper) to my Society headquarters. That ended our correspondence. I never even got an answer.

I know that this firm got the job on a bid basis, because the mayor told me what their bid was.

Competitive bidding seems to be permissible if your firm is big and reputable enough. No embarrassing questions seem to be asked by the Founder Societies in these instances.

However, I have since had nothing to do with competitive bidding. I stick to my political knitting.

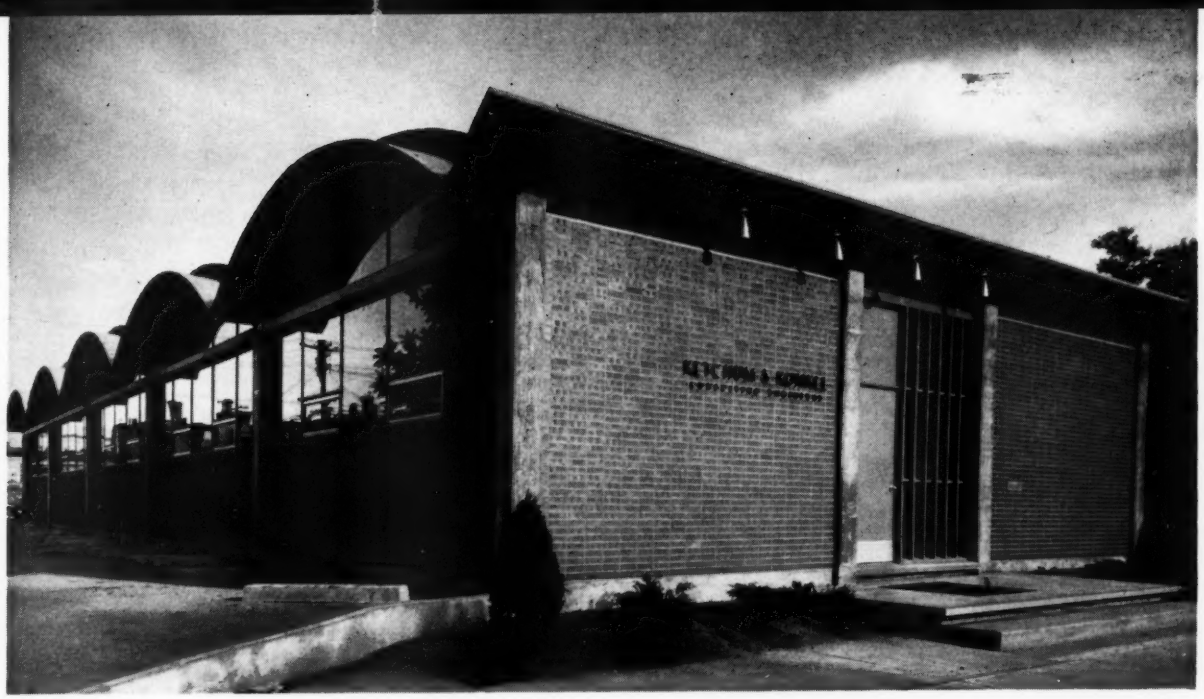
Technical vs Business Ethics

I did not want to go into this business of using a commission agent. I was forced into it by my "ethical" contemporaries. And if political engineering is necessary, then I am going to do a thorough job of it.

I also can state with some pride that no matter how I get my work, I always have given my client the very best engineering I know how to give. Perhaps my low business ethics makes me compensate when I turn to my technical tasks. I have never so much as taken a lunch from a manufacturer or a cigar from a contractor. My designs and specifications are my own, and I see to it that they are met. I have saved the taxpayers more money than they will ever know, and I have many projects of which I am, as an engineer, rightly proud.

I am not proud of either my or my competitors' dealings with commission agents, but this problem can be solved only if we acknowledge that it exists. I will be glad to give up one of my two hats when the others do.

But I don't like starving. I tried it. ▲▲



OVERHANG ON ROOF EXPRESSES SHELL DESIGN OF NEW OFFICE BUILDING FOR KETCHUM & KONKEL.

An Office Designed for Efficiency

MILO S. KETCHUM and E. VERNON KONKEL
Ketchum & Konkel, Consulting Engineers

THE EFFICIENCY of an engineering office depends to a great extent upon the working conditions, and particularly the quality of light. If this efficiency can be improved only a few percent, the resulting savings are sizeable and warrant an increase in the payments for rental. This theory guided us in the design of our new office building.

There were, of course, other considerations influencing the selection of the plan and the structure. This firm primarily is concerned with furnishing structural engineering services to architects and, therefore, we felt that the building should be of unusual structural and architectural interest and constructed of good materials. Adequate parking had to be available for the staff and clients' cars, and yet we wanted a location as close as possible to our clients and the central part of Denver.

Light and Structure

Our solution is shown in the plan and photographs. The structure is a concrete thin shell barrel vault structure. The design is unusual but conservative. We were fairly sure that this solution would be satisfactory because the firm had built another office building seven years ago on the same planning principles, and it was entirely satisfactory.

The light problem was handled by orienting the ends of the barrels to the north and the south with a fairly large overhang on the south to protect the building from the heat and light of the summer sun. In the winter, venetian blinds are required to shade the south windows but the light control is satisfactory. On the north there is only an overhang of two feet to show that a shell structure is used. The east and west walls of the building are devoid of windows (except for the area around the doors) to avoid the strong east and west light.

Another control on the quality of light is the height of the sill of the exterior wall. It was arranged so that there is no outside distracting light



RECEPTION ROOM, LOOKING TOWARD FRONT ENTRY. FURNITURE WAS DESIGNED BY PROPST OF DENVER.



CONFERENCE ROOM AND LIBRARY IS WELL LIGHTED; HAS CHALK BOARD AND SCREEN FOR PHOTO PROJECTION.

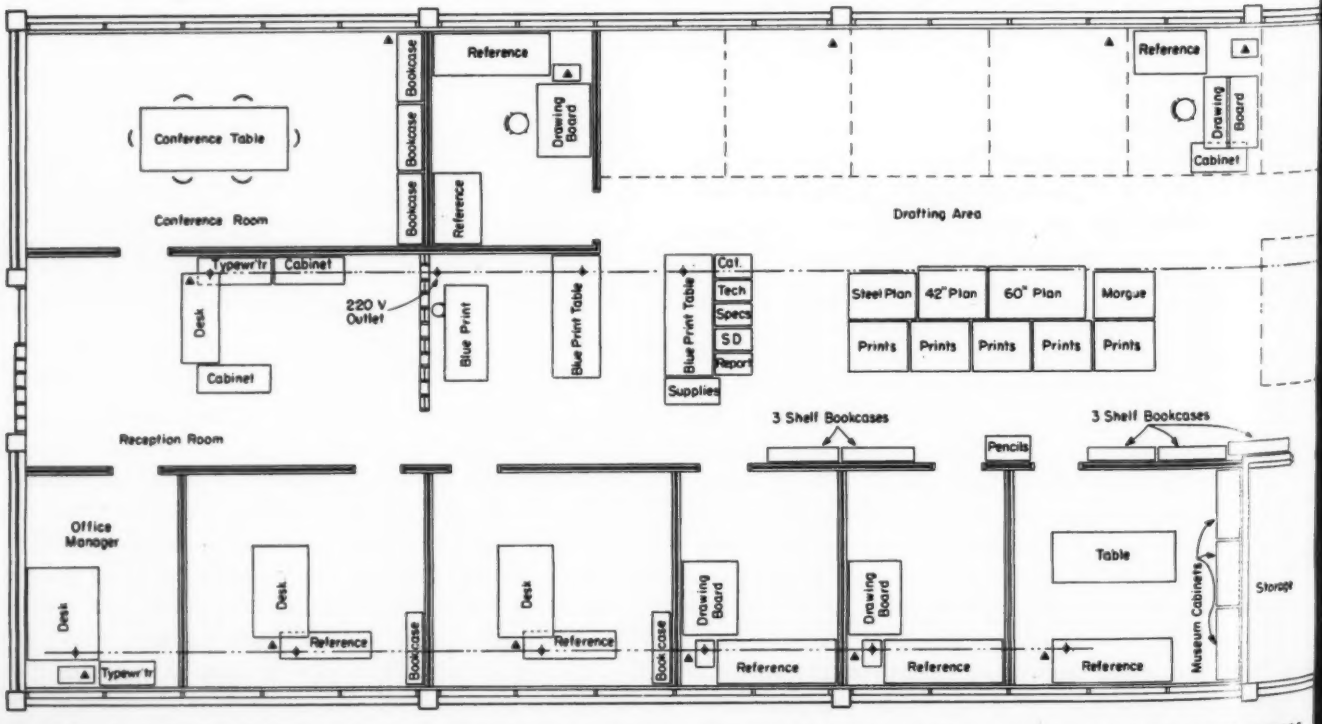
when the engineer is seated at his drawing board. The sill height chosen for this building is five feet. There is a shadow close to the wall, but there are cabinets or reference tables in these areas. Most of the natural light in the building comes not from the sky but by reflection from the ground to the underside of the roof. Light readings of 200 or more foot-candles were observed on the working surface of the drafting tables on a summer day. Artificial illumination will be needed in the daytime only on the darkest winter days. Lights will provide 70 to 90 foot-candles at night.

The building is built on three lots, 150-ft deep with a total width of 75 feet. This permitted construction of a building with outside dimensions of 38 feet by 113½ feet, and off-street parking for 22 cars. The inside dimension for the width is 36 feet. This allows 12-ft wide private offices on each side and a 12-ft wide entrance and secretarial space. Offices are provided for the two partners, for three associates, and for the office manager. A combined library and conference room with a chalk board and screen and space for future expansion of the library is adjacent to the front door.

Office Layout

The blueprinting equipment is located immediately behind the reception and secretarial space so the secretary or office manager can make prints and yet tend to the reception area and telephone. The plan file area and print racks are immediately behind this work area, and the engineering staff is adjacent to the north light windows. A space of 7 feet by 12 feet has been allocated for each engineer, and a telephone is provided on every other drafting table. The chief draftsman is in an office at the west end of the drafting room so he can supervise all operations in his department. An employee lunch area is provided at the east end of the building with two electric hot plates and a sink. Also, a sample room and staff conference room is adjacent to the central core area.

In a shell structure large ductwork for heating and air-conditioning is not attractive. Therefore, a



BUILDING IS 38-FT WIDE AND 113-FT LONG. OFFICES ARE ALONG SOUTH SIDE, AND DRAFTING ROOM PARALLELS NORTH WALL.

complete plenum was constructed under the floor and up the walls so that both cold and warm air enter the rooms at the sill height. The walls are furred out with 2-in. x 2-in. wood members, and drywall construction is used on the inside.

Utility Core

The utility core containing the heating equipment, toilets, plan vault, and a storage room is located on the south side of the building, one bay from the east end. A boiler on the mezzanine furnishes hot water to a series of coils in a fan unit. Air is forced downward into the plenum and comes out at sill height all around the building through an aluminum grille discharging at a slight angle to the wall so that descending cold air will be forced upward.

The water tower and compressor for the air-conditioning system are located outside the building adjacent to the utility core. The fan has a two-speed motor so that in winter the velocity through the system will be less than in summer. The air-conditioning system is practically draft free. With the upward discharge of the grilles at sill height, cool air spreads evenly to the middle of the room.

Ceiling and Roof

The ceiling of the structure is treated with acoustical plaster to reduce the noise level. There are no unpleasant reverberations with the curved surfaces, and the curvature of individual barrels keeps noise from carrying from vault to vault.

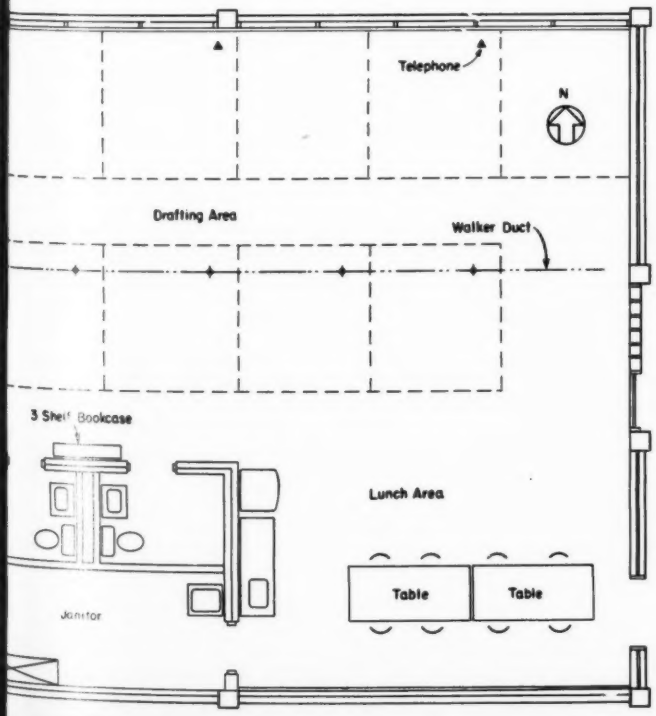
Partitions are constructed of hollow core mahogany doors. This is about the least expensive type of wood paneling. It goes together quickly and, we hope, can be changed easily to fit new conditions.

The structure of the roof is a series of thin shell concrete vaults. The spans are 37 feet center to center of columns and 22½-ft wide. The shell thickness is 3.25 inches, which is based on the amount of cover over the reinforcing steel rather than any consideration of strength. The width of the barrel permitted the roof to be formed with three lengths of 8-ft plywood. The entire roof was formed at one time because the contractor had all the material in his yard. The labor cost according to the contractor was about 5 cents a square foot more than the cost of forming a flat plate roof. Ordinary roofing materials were used for the roof covering. Insulation was 2½ inches of perlite concrete.

Cost Figures

The cost of the building was $14.20 per square foot of floor area, which included all light fixtures, floor coverings, and exterior paving. The cost of the shell structure, including columns, grade beams, and foundations, was about $2.10 per square foot of roof area, and this figure includes contractor's overhead and profit. The heating contract, including plumbing and air-conditioning, was $13,800. To this must be added the extra cost of the plenum below the floor. The electrical contract was $7000, including fixtures for offices and conference rooms.

The architect for this building was Jerome K. Nagel, of Denver. The mechanical engineers were Stark and Konkel; electrical engineers, Swanson and Rink. The structural engineers were, of course, Ketchum and Konkel, and our contractor was the Hyder Construction Company. ▲▲



PERSONNEL EFFICIENCY WAS KEYSTONE FOR ALL PLANNING.



DRAWING BOARDS ARE NEXT TO NORTH WALL OF ROOM.

TABLE 1—PROPERTIES OF NEUTRONS, PROTONS AND ELECTRONS

Type of Particle	*Charge, coulombs*	*Mass, grams*	*Atomic Mass, amu*
Neutron	0	1.675×10^{-24}	1.008982
Proton	1.601×10^{-19}	1.672×10^{-24}	1.007593
Electron	-1.601×10^{-19}	9.04×10^{-28}	5.4876×10^{-4}

Fundamentals of Nuclear Power



JOHN F. LEE, Distinguished Professor & Graduate Administrator
Department of Mechanical Engineering
North Carolina State College

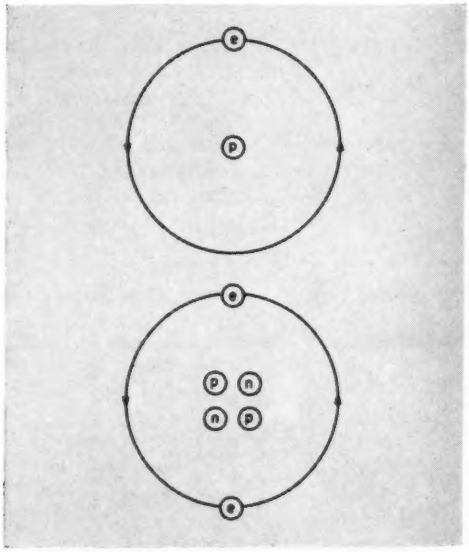
John F. Lee teaches nuclear engineering at North Carolina State College, and heads their reactor program—one of the finest at any school in the country. He received his B.S. in Engineering at The Citadel and his M.S. in Mechanical Engineering from Harvard. He went to work for Stone and Webster in 1941, and stayed with them until 1947 (with time out for service with the armed forces overseas). After the War he taught at the University of Maine, moving to N.C. State in 1952. He is editor of Nuclear Engineering magazine, published by Consulting Engineer Publishing Co.

THE PEACEFUL APPLICATION of nuclear energy is a most challenging engineering frontier. The most significant peaceful application of nuclear energy is the nuclear power plant which will supplement dwindling supplies of fossil fuels and produce electricity at lower cost. Nuclear power is now a job for the engineer. A surprisingly modest knowledge of physics, in addition to an engineering background, is all that is required to master the principles of this new branch of science.

Nuclear and Conventional Plants

The difference between the nuclear power plant and the conventional plant is in the source of energy. The source of energy in a nuclear power plant is a controlled chain reaction which occurs in a nuclear reactor. Hence, the nuclear reactor takes the place of the conventional steam generator of the steam power plant or the combustor of a gas turbine power plant. Although this substitution is simple in theory it requires certain modifications in the power plant itself and offers new problems which must be dealt with in a special manner.

The nuclear reactions in a reactor consist of splitting an atom into fragments. This releases energy, but along with the energy we must accept certain radiations which can be harmful if adequate safeguards are not provided. Furthermore, it is necessary to provide a means of insuring a controlled and sustained nuclear reaction, just as it is necessary to control and sustain combustion in a conventional furnace. Finally, the conditions in a nuclear reactor impose special restrictions on the types of materials that can be used in its construction. However, an understanding of nuclear power problems, and an ap-



FIGS. 1 & 2—BOHR MODELS: TOP, HYDROGEN ATOM; BOTTOM, HELIUM ATOM.

preciation of the potentialities of this new source of energy, must be prefaced by a familiarity with the nature of the atom and the phenomena which occur in the reactor.

Atomic Structure

It will be recalled that an *atom* has been defined as the smallest particle of matter which remains unchanged in a chemical reaction. At one time the atom was thought to be indivisible but now it is known that the atom can be split into smaller particles. Structurally the atom is a planetary system consisting of a nucleus of protons, or protons and neutrons, about which electrons move in rings or orbits. An electron has a negative electrostatic charge. A proton has a positive charge of the same magnitude as that of an electron. A neutron has no charge. Each of these particles has a definite mass which, with its electrostatic charge, is given in Table 1.

The last column of Table 1 gives the atomic mass of the particle in atomic mass units (amu). An atomic mass unit is defined as one-sixteenth of the mass of an oxygen atom, or 1.66×10^{-24} grams. It should be noted that the atomic mass of an element is slightly different from its atomic weight, which is the ratio of the mass of the element to the mass of hydrogen. Atomic mass is given in actual units of mass whereas the atomic weight represents a relative mass.

Fig. 1 shows the familiar Bohr model of hydrogen which is the lightest atom and is, structurally, the simplest. The hydrogen atom has one proton in the nucleus and one electron in the orbit. Since the proton has a positive charge of 1.601×10^{-19} coulombs, and the electron has a negative charge of the same magnitude, the net charge of the atom is zero. This observation is true of all atoms, and the general statement can be made that the number of electrons in the orbit is equal to the number of protons in the nucleus. Fig. 2 shows a model of the helium atom which has two protons and two neutrons in the nucleus. Therefore, there are two electrons in the orbit. Similar models can be constructed for any atom.

The number of protons in the nucleus of an atom establishes its atomic number, which is designated by the symbol Z. The atomic number, in turn, establishes the position of an atom in the periodic table beginning with hydrogen which has an atomic number of unity and ending, at present, with Mendelevium which has an atomic number of 101.* The mass number, designated by the symbol A, is the total number of protons and neutrons in the nucleus of an atom. Hence the number of neutrons in a nucleus is equal to the difference between the mass and atomic numbers, or $N = A - Z$. The atomic number is designated by a subscript placed on the chemical symbol of an element, and the mass number is indicated by a superscript, or ${}_{z}$(chemical symbol)^{A}. Table 2 shows examples of the notation with additional atomic data for a few elements.

Radioactivity

One of the by-products of energy production in a nuclear reactor is radioactive material. Natural radioactivity is the spontaneous emission from certain heavy atoms of penetrating radiations as the result of a process known as radioactive decay. One or more of three types of harmful radiations can be emitted in the form of alpha-particles, beta-particles, and gamma-rays. Some atoms which are not naturally radioactive can be made radioactive by bombarding the nucleus of the atom with high-speed particles, such

* Argonne Nat. Lab. announced on July 9th the discovery of Nobelium, which is element 102, with an apparent mass number of 253.

TABLE 2—ATOMIC DATA

Element	*Atomic number, Z*	*Mass number, A*	*Number of neutrons, N*	*Mass, amu*
Electron, ${}_{-1}e^{0}$	–1	0		5.4876×10^{-4}
Proton, ${}_{1}p^{1}$	1	1	0	1.007593
Neutron, ${}_{0}n^{1}$	0	1	1	1.008982
Hydrogen, ${}_{1}H^{1}$	1	1	0	1.008142
Helium, ${}_{2}He^{4}$	2	4	2	4.00387
Lithium, ${}_{3}Li^{6}$	3	6	3	6.01682
Lithium, ${}_{3}Li^{7}$	3	7	4	7.01818
Boron, ${}_{5}B^{10}$	5	10	5	10.01611
Boron, ${}_{5}B^{11}$	5	11	6	11.012811
Carbon, ${}_{6}C^{12}$	6	12	6	12.003807
Carbon, ${}_{6}C^{13}$	6	13	7	13.007538
Oxygen, ${}_{8}O^{16}$	8	16	8	16.000000
Oxygen, ${}_{8}O^{17}$	8	17	9	17.00449
Nitrogen, ${}_{7}N^{14}$	7	14	7	14.00750
Uranium, ${}_{92}U^{235}$	92	235	143	235.11704
Uranium, ${}_{92}U^{238}$	92	238	146	238.1234

NUCLEAR REACTION EQUATIONS

$_{92}U^{238} \longrightarrow {}_{90}Th^{234} + {}_{2}He^{4}$. (alpha decay) (1)

$_{90}Th^{234} \longrightarrow {}_{91}Pa^{234} + {}_{-1}e^{0}$ . . (beta decay) (2)

$_{2}He^{4} + \text{energy} + {}_{7}N^{14} \longrightarrow {}_{8}O^{17} + {}_{1}p^{1}$ . . (3)

$_{92}U^{238} + {}_{0}n^{1} \longrightarrow {}_{92}U^{239} + \gamma$ ..... (4)

$_{92}U^{239} \xrightarrow{23.5 \text{ minutes}} {}_{-1}e^{0} + {}_{93}Np^{239}$ ..... (5)

$_{93}Np^{239} \xrightarrow{2.3 \text{ days}} {}_{-1}e^{0} + {}_{94}Pu^{239}$ ..... (6)

$_{90}Th^{232} + {}_{0}n^{1} \longrightarrow {}_{90}Th^{233} + \gamma$ ..... (7)

$_{90}Th^{233} \xrightarrow{23.5 \text{ minutes}} {}_{91}Pa^{233} + {}_{-1}e^{0}$ ..... (8)

$_{91}Pa^{233} \xrightarrow{27.4 \text{ days}} {}_{92}U^{233} + {}_{-1}e^{0}$ ..... (9)

as alpha-particles. This radioactivity is said to be induced or artificial.

An alpha-particle is a helium nucleus and, therefore, has a mass number of 4 and an atomic number of 2. When an alpha-particle is emitted, the nucleus of the atom loses 2 protons and 2 neutrons. An alpha-particle is emitted at a speed of approximately 10,000 miles per second and is brought to rest by collisions with an absorber from which it eventually picks up electrons to become a normal helium atom. Alpha-particles do not possess much penetrating power and can be stopped by a sheet of paper.

A beta-particle is actually an electron emitted from a radioactive atom. Hence, it has the same mass and charge as an electron. The mass number of an electron is zero and its atomic number is –1. The penetrating power of a beta-particle is higher than that of an alpha-particle. However, only a few millimeters of a metal, such as aluminum, are required to stop beta-particles.

Gamma-rays are physically identical to X-rays but have much higher energy levels. They are electromagnetic waves having a wavelength approximately 100 times shorter than X-rays. Gamma-rays have a penetrating power so great that a considerable thickness of material is required to stop them.

TABLE 3—URANIUM SERIES

Element	*Half-life*	*Type of Decay*
Uranium, $_{92}U^{238}$	4.5×10^{9} years	α
Thorium, $_{90}Th^{234}$	24 days	β, γ
Protoactinium, $_{91}Pa^{234}$	1.14 minutes	β, γ
Uranium, $_{92}U^{234}$	3×10^{5} years	α
Thorium, $_{90}Th^{230}$	83,000 years	α, γ
Radium, $_{88}Ra^{226}$	1600 years	α, γ
Radon, $_{86}Rn^{222}$	3.8 days	α
Polonium, $_{84}Po^{218}$	3.1 minutes	α
Lead, $_{82}Pb^{214}$	26.8 minutes	β, γ
Bismuth, $_{83}Bi^{214}$	19.7 minutes	β, γ
Polonium, $_{84}Po^{214}$	10^{-5} sec	α, γ
Lead, $_{82}Pb^{210}$	22 years	β
Bismuth, $_{83}Bi^{210}$	5 days	β, γ
Polonium, $_{84}Po^{210}$	140 days	α
Thallium, $_{81}T1^{206}$	4 minutes	β
Lead, $_{82}Pb^{206}$	stable	—

Decay of Radioactive Atoms

When a natural or artificial radioactive atom decays, a new atom is formed which also may be radioactive and will itself decay. A sequence of atomic transformations takes place until a stable atom is formed. There are three natural radioactive series, known as the uranium, thorium, and actinim series, in which U-238, Th-232, and U-235 decay to Pb-206 (lead). Table 3 shows that, in the uranium series, U-238 undergoes 15 transformations to become Pb-206. The first transformation, for example, is given by Equation (1) in the block of equations where $_{2}He^{4}$ represents the helium nucleus equivalent to an alpha-particle. (It should be noted that the atomic and mass numbers on the two sides of the equation must balance.) The next step in the decay process is an example of beta-decay given by Equation (2) where $_{-1}e^{0}$ represents the electron.

The first discovery of induced radioactivity was in an experiment in which nitrogen was bombarded by a high-speed alpha-particle to yield a proton and an oxygen atom. The decay reaction in this experiment is expressed as Equation (3) where $_{2}He^{4}$ is the alpha-particle and $_{1}p^{1}$ is the proton. It will be noted that the oxygen atom produced in the reaction has a larger mass number than ordinary oxygen, which has a mass number of 16. These oxygen atoms are isotopes, which are defined as two or more atoms having the same atomic numbers but different mass numbers. Several isotopes of different elements can be identified in Table 2.

Half-Life

In addition to identifying the types of radiations emitted from radioactive material, it is necessary to know how long the material will remain active. This information is particularly important in connection with the disposal of waste materials from nuclear reactors. It is impossible to predict when a particular radioactive atom will emit an alpha- or beta-particle, but when a large number of atoms of the same element are present, the laws of probability can be applied to predict the rate of decay. At the end of some period of time, half of the atoms will have decayed. In an additional and equal period of time, half of the

EXAMPLES OF NUCLEAR COMPUTATIONS

Example 1. What change in atomic mass has occurred in the reaction of Eq. 3, and how is this increase explained in view of the law of conservation of mass?

Solution. The mass of each element and particle in Eq. 3 can be obtained from Table 2 as follows:

$$\begin{array}{rl} {}_2He^4 = & 4.00387 \text{ amu} \\ {}_7N^{14} = & \underline{14.00750 \text{ amu}} \\ & 18.01137 \text{ amu} \end{array} \qquad \begin{array}{rl} {}_8O^{17} = & 17.00449 \text{ amu} \\ {}_1p^1 = & \underline{1.00759 \text{ amu}} \\ & 18.01208 \text{ amu} \end{array}$$

Hence the mass has been increased by (18.01208 – 18.01137) amu = 0.00071 amu. One conclusion drawn from Einstein's special theory of relativity is the equivalence of energy and mass expressed by formula:

$$E = mc^2$$

where E is energy, m is mass, and c is the velocity of light ($C = 3 \times 10^{10}$ cm/sec). Hence,

$$E = \frac{0.00071 \text{ amu} \times 1.66 \times 10^{-24} \text{ gm/amu } (3 \times 10^{10})^2 \text{ cm}^2/\text{sec}^2 \times 1 \text{ erg-sec}^2/\text{gm-cm}^2}{1.6 \times 10^{-12} \text{ erg/electron volt}}$$

$$= 660{,}000 \text{ ev} = 0.66 \text{ mev}$$

The increase in mass is equivalent to this amount of energy.
Hence the alpha-particle must have this amount of kinetic energy for the reaction to take place.
The preceding conversion of units could have been made more conveniently, since 1 amu = 931.2 mev, as

$$E = 0.00071 \text{ amu} \times 931.2 \text{ mev/amu} = 0.66 \text{ mev}$$

Example 2. How many grams of U-235 are consumed in producing 250,000 kwh of thermal energy?

Solution. There are 200 mev of energy released in a single fission and 1 watt-sec. = 6.25×10^{12} mev. Therefore, the number of fissions required to produce 250,000 kwh is

$$\frac{2.5 \times 10^8 \text{ watt-hr} \times 3.6 \times 10^3 \text{ sec/hr} \times 6.25 \times 10^{12} \text{ mev/watt-sec}}{200 \text{ mev/fission}} = 28.1 \times 10^{21}$$

One of the conclusions drawn from the Avagodro hypothesis is the Avagodro number, 6.0247×10^{23}, which is the number of atoms in a gram-atomic weight of any substance. The atomic weight of U-235 is 235 and, since the number of fissions is equal to the number of atoms, we have

$$\text{Number of grams} = \frac{28.1 \times 10^{21} \text{ atoms} \times 235 \text{ gm/gm-atomic weight}}{6.0247 \times 10^{23} \text{ atoms/gm-atomic weight}} = 10.95$$

Example 3. If 2.3 neutrons are available in each fission for a steady chain reaction of U-235 and for breeding Pu-239, (a) how many grams of plutonium are bred for each gram of U-235 consumed? (b) How much thermal energy is produced for each gram of U-235 if 170 mev are released in each fission?

Solution. (a) There are 1.3 neutrons available in each fission for breeding. One gram of U-235 has

$$\frac{1 \text{ gm} \times 6.0247 \times 10^{23} \text{ atoms/gm-atomic weight}}{235 \text{ gm/gm-atomic weight}} = 2.57 \times 10^{21} \text{ atoms}$$

Since there is one fission per atom and 1.3 excess neutrons are available in each fission, the total number of excess neutrons is

$$2.57 \times 10^{21} \text{ fissions} \times 1.3 \text{ neutrons/fission} = 3.34 \times 10^{21} \text{ neutrons.}$$

Therefore, there are 3.34×10^{21} atoms of Pu-239 produced and the total mass is

$$\frac{3.34 \times 10^{21} \text{ atoms} \times 239 \text{ gm/gm-atomic weight}}{6.0247 \times 10^{23} \text{ atoms/gm-atomic weight}} = 1.32 \text{ gm}$$

Solution. (b) From part (a), there are 2.57×10^{21} fissions in a gram of U-235 and 1 watt-sec = 6.25×10^{12} mev. Hence, the thermal energy released in the fission of one gram of U-235 is

$$\frac{2.57 \times 10^{21} \text{ fissions} \times 170 \text{ mev/fission}}{1000 \text{ watts/kw} \times 6.25 \times 10^{12} \text{ mev/watt-sec} \times 3600 \text{ sec/hr}} = 19{,}400 \text{ kw-hr}$$

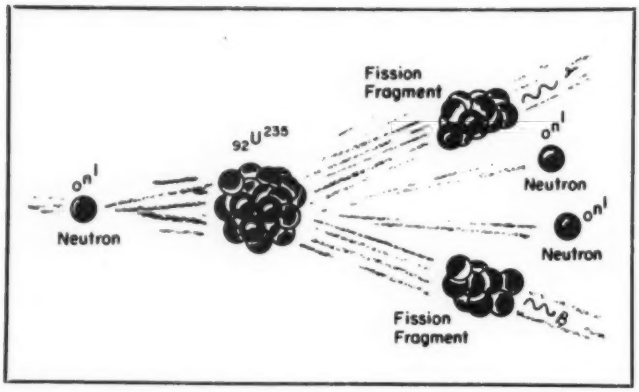


FIG. 3 — NUCLEAR FISSION OF AN ATOM OF U-235.

residue from the previous decay period will decay. Therefore, the half-life is defined as the interval of time necessary for half of the radioactive atoms present in the material to decay. The half-life of different radioactive elements varies from a few seconds to billions of years. Table 3 gives the half-life of each radioactive element in the uranium decay series.

Nuclear Fission

Although radiation is an important consideration in maintaining safe and healthful conditions in the vicinity of a reactor, the most important nuclear reaction, from the standpoint of power production, is fission. Fission occurs when a heavy element, such as U-235, is bombarded by a neutron, which causes the atom to split into two fragments of nearly equal mass and emit high-speed neutrons. Fig. 3 shows, diagrammatically, the fission of an atom of U-235. The uranium atom is split into two fragments consisting of elements having atomic numbers ranging from 34 to 58. A quantity of mass is missing, but it is replaced by the release of 200 mev of energy. In addition a number of neutrons are released from the uranium nucleus. Of the 200 mev of energy released about 170 mev are represented in the kinetic energy of the fission fragments. When these fragments collide with neighboring atoms and molecules they are decelerated. As a result the thermal energy of the region and the temperature increase. Gamma and beta radiations and the kinetic energy of the emitted neutrons account for the remaining 30 mev of energy.

The neutrons released in one fission may split other atoms of U-235 in a sustained nuclear process called a chain reaction. Not all the neutrons released in fission are available for this purpose because some escape or are captured by nonfissionable elements. If more neutrons are available for fission than are lost, the chain reaction is sustained. Otherwise the reaction will stop.

Statistically, 2.5 neutrons are released in a single fission. Assume that in each fission half a neutron is absorbed and escapes. The two remaining neutrons split atoms which emit a total of four neutrons. These are available for further fissioning,* as shown in Fig. 4. Hence the original neutron has been multiplied four times and the fission rate increases with each step in an uncontrolled chain reaction such as takes place in an atomic bomb.

Control by Absorbers

It is clear that a steady chain reaction is desired in a nuclear reactor, and hence the number of neutrons available at the end of each step in the reaction must be constant. If a substance with the ability to absorb neutrons is placed in the vicinity of the reaction, it is possible to maintain a constant population of neutrons and a steady chain reaction. In Fig. 5 the absorber appears in the form of the familiar control rods of boron or cadmium, which have a large capacity for capturing neutrons. The captive power of the rods is a function of the surface exposed to the reaction. Pushing the rods all the way into the reactor provides such a large neutron capture surface that all neutrons are absorbed and the reaction stops. The rods can be pulled out to such an extent that a delicate balance is struck between neutron capture and neutron production, and the reaction proceeds at a steady rate.

The Moderator

One other factor is important in nuclear reactions. It has been found that U-235, U-233, and Pu-239 are more effectively fissioned by neutrons of low kinetic energy (about 0.025 ev) called thermal neutrons. The neutrons released in fission are fast neutrons, having a kinetic energy of approximately 2 mev. Hence, some means must be provided for reducing the kinetic energy of the neutrons before fission. A material that slows down neutrons is called a moderator. Moderation takes place by successive collisions be-

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* The use of *fission* as a verb seems to be accepted not only here but in England. We must now await the use of *to fusion* and, unfortunately, *fusioning*.

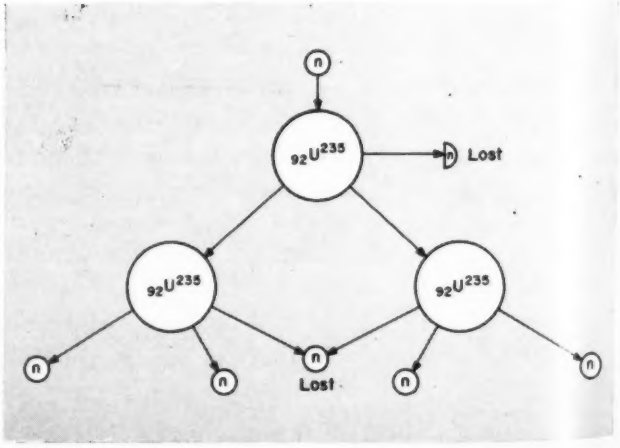


FIG. 4 — TYPICAL UNCONTROLLED CHAIN REACTION.

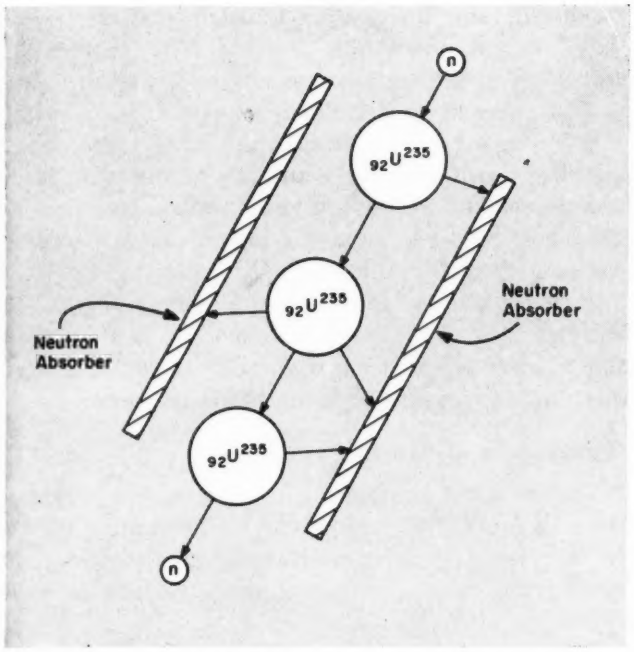


FIG. 5 — CONTROLLED OR STEADY CHAIN REACTION.

tween the fast neutrons and the nuclei of the moderator. The moderator, like other materials used in a reactor, must not absorb neutrons. The number of collisions required to reduce fast neutrons to thermal levels is smaller when lighter elements are used as moderators. Beryllium, beryllium oxide, carbon, and ordinary water are excellent moderators, but heavy water is the best.

Fission With Fast Neutrons

Some fissionable elements, such as U-238, Th-232, Pa-231, and Np-237, can be fissioned only by fast neutrons having a kinetic energy of about 1 mev. For these materials a moderator is not necessary and is actually undesirable. Natural uranium is a mixture of 99.3 percent U-238 and only 0.7 percent U-235. Hence, the thermal neutrons provided for the fission of U-235 cannot fission the U-238 but instead are captured by it without fission. Therefore, a thermal chain reaction in natural uranium is impossible.

Although it is possible to separate the U-235 from the natural mixture, the process is very complex and expensive. If nuclear power plants were confined to the use of U-235 as a fuel, their future development would be severely limited. Fortunately, a number of other fissionable materials can be made available.

Transmutation

When the thermal neutron is absorbed in natural uranium, the U-238 is transmuted to the element Pu-239 which, after processing, is fissionable by thermal neutrons. The successive nuclear reactions are given by Equations (4), (5), and (6).

The possibility of using the excess neutrons produced in the fission of U-235 to transmute U-238 to the nuclear fuel Pu-239 is immediately suggested. A moderator is used to slow down the neutrons to thermal levels, and the thermal neutrons in excess of the one required for a steady chain reaction are utilized to transmute U-238 in a process called breeding. A blanket of natural uranium may be used for this purpose.

Another abundant natural nuclear fuel is $_{90}Th^{232}$ which, when bred into U-233, is fissionable by thermal neutrons, according to the reactions given by Equations (7), (8), and (9).

Breeding Plutonium

Fig. 6 shows, schematically, the breeding of Pu-239 and U-233. The figure suggests the possibility of breeding more fissionable fuel than is consumed. However, the absorption or escape of neutrons is likely to reduce this production rate. If Pu-239 is substituted for U-235 as a fuel, the average number of neutrons released is three, and the yield of bred fuel can exceed the quantity of fuel consumed.

The fissionable material bred must be separated from the residue, but the process is not complex and can be accomplished at reasonable cost. The fuel produced in the breeding process can be used as fission-

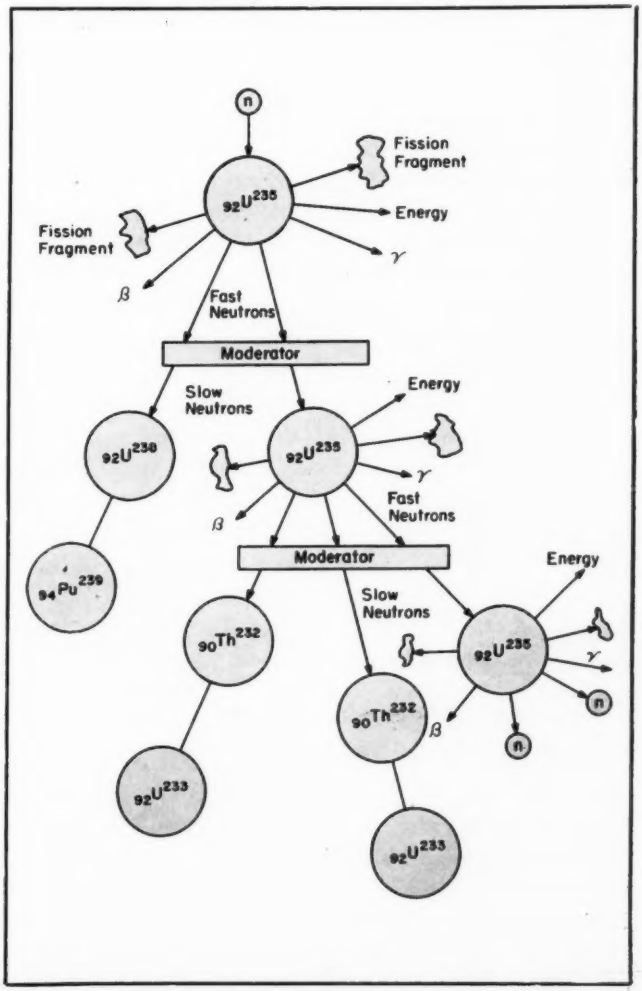


FIG. 6 — BREEDING OF FUELS — PU-239 AND U-233.

able material in the same reactor or removed and sold as a premium fuel.

Reactor Components

A prime component of any reactor is the nuclear fuel. The fuel may be supplied in the form of a chemical compound such as uranyl sulfate, UO_2SO_4, or uranyl nitrate, $UO_2(NO_3)_2$. Fuel is also provided in the form of an alloy or finely divided slurry. A reactor provided with fuel in any of these forms is called a homogeneous reactor. Often the fuel is provided in lumps embeded in a moderator, and the reactor using such fuel is said to be heterogeneous.

Ordinary water often is used as a moderator. A common practice is to use a solution of uranyl sulfate or uranyl nitrate and water. When the fuel is prepared in alloy form, one of the constituents may be a moderator, or the moderator may be kept separate.

The thermal energy released in any reactor must be removed to protect the reactor materials from excessively high temperatures. In a power reactor this energy is converted into electrical energy in a power plant. This means that a coolant is required. Two cooling schemes for power reactors are possible. A single fluid can serve a dual purpose — as a reactor coolant and as a working fluid in the power plant. If this design is adopted, steam must be generated in the reactor at suitable temperatures and pressures for expansion in the turbine. This is called a boiling water reactor. Unfortunately, the temperatures and pressures permitted in a reactor are restricted by available reactor materials. At present, temperatures below 1000 F must be maintained except in special-purpose reactors where a higher investment in special materials is economically justifiable.

Another arrangement is to use a separate coolant for the reactor with a heat exchanger providing for the transfer of heat to the working fluid of the power plant. Because of an inevitable temperature drop in the heat exchanger, the working fluid of the power plant cannot reach the maximum temperatures allowable in the reactor. However, a wider choice of reactor coolants is possible. Any fluid used in a reactor for cooling purposes must have good heat transfer properties, low neutron capture, and low induced radioactivity. Helium, liquid sodium, liquid sodium-potassium, heavy water, and ordinary water commonly are used as coolants.

Reactor Shielding

No reactor would be complete without adequate safeguards for the health and safety of the people working in its vicinity. It will be recalled that the nuclear fuels are naturally radioactive. The fission products are radioactive, and radioactivity is induced in some of the substances present in the reactor. The alpha- and beta-particles offer no problem since they can be stopped by relatively thin sheets of metal. The gamma-rays and neutrons are a more serious difficulty and can cause severe physiological damage if they are not effectively shielded. The problem is compounded by the fact that materials that are good gamma-ray shields are rarely good neutron shields.

Water is a good neutron shield since it is a good moderator and effectively reflects the neutrons back into the reactor. A dense material such as lead or concrete is effective as a gamma-ray shield. To increase the density of concrete it is customary to mix steel punchings, shot, or scrap metal in the aggregate. To increase the effectiveness of concrete as a neutron shield, a cement that has the ability to retain a large quantity of water in chemical bond is used.

Classification of Reactors

The advance of nuclear reactor technology has been so rapid that a profusion of descriptive names for the various types of reactors has appeared. A complete definition of a reactor is given in terms of:

¶ the type of fuel
¶ the speed of the neutrons (thermal or fast)
¶ the type of moderator (for thermal reactors)
¶ the arrangement of the fuel
¶ the purpose of the reactor.

For example, the Shippingport reactor can be described as a natural uranium, thermal, water moderated, heterogeneous, power reactor. Reactors also are incompletely defined according to any of these subclassifications that represent a distinguishing feature of the reactor. These incomplete or subclassifications of reactors are the cause of much of the confusion. Nevertheless, they serve an extremely useful purpose in establishing a familiarity with the basic features of the large variety of available reactors.

Nuclear reactors can be classified according to their primary function or purpose.

Power Reactor — A power reactor is used primarily as the basic source of energy for a power plant. The reactor may be large or small, depending on the capacity and type of power plant it serves. Power reactors can be used in large central steam or gas turbine power stations. Smaller and lighter power reactors can be used in the propulsion power plants of submarines, surface ships, locomotives, and aircraft.

Research Reactor — A research reactor may produce power as a by-product. Its primary purpose is for scientific research in basic physics and nuclear engineering. It serves as a source of radioisotopes and neutrons.

Materials Testing Reactor — A materials testing reactor is used to determine the effect of radiation on various organic and inorganic materials. The object is not only to determine the deleterious effect of radiation on materials and the tolerance level of materials to radiation damage but also to discover the beneficial effects of radiation on some materials.

Critical Assembly—A critical assembly is a low-power-level reactor consisting of an assembly of fissionable material and a moderator. Its purpose is to

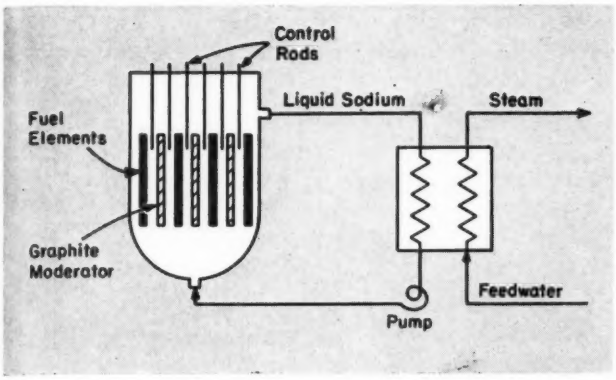


FIG. 7—HETEROGENEOUS, SODIUM GRAPHITE REACTOR.

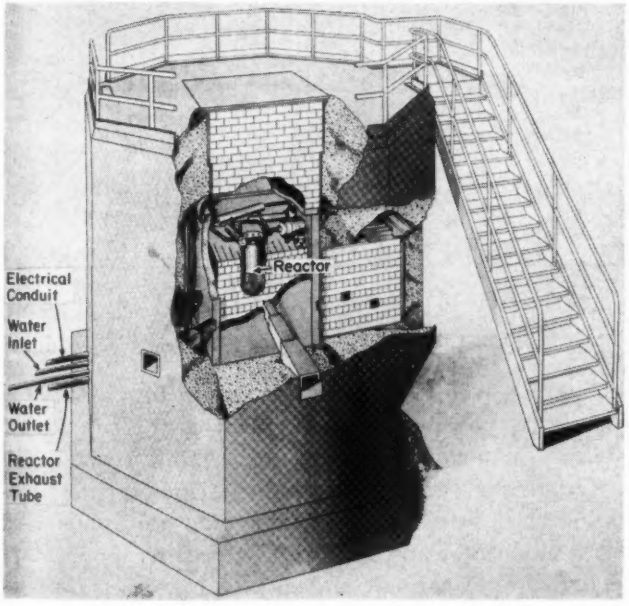


FIG. 8—VIEW OF AQUEOUS HOMOGENEOUS REACTOR.

determine the effect on reactor design of various geometries, materials, and compositions.

Regenerative Reactor — The regenerative reactor has the dual purposes of producing nuclear fuel and heat or power. Uranium-235 and the more plentiful nonfissionable materials, uranium-238 or thorium, are loaded into the reactor. The fissioning of uranium-235 produces neutrons which convert uranium-238 into fissionable plutonium-239 or thorium into fissionable uranium-233. The fissionable materials produced then are used as fuel in the core of the reactor. Hence, the reactor process is said to be regenerative, and it offers the advantage of utilizing less expensive and more plentiful nuclear fuels.

Breeder Reactor — The breeder reactor differs from a regenerative reactor in that it produces as much or more fissionable material than it consumes. The fissionable material produced in this type of reactor is used as the fuel for other reactors or atomic weapons. Breeder reactors can have the dual purposes of producing usable heat or power and fissionable materials. They also are called *production reactors* when their sole purpose is to produce fissionable material and the heat generated is disposed of as a waste product.

Package Reactor — A package reactor is a relatively small and transportable reactor which can be assembled on a permanent or semipermanent basis at some remote location. Usually the package reactor is used to produce power, but it also may be used to produce heat — either exclusively or in conjunction with power production.

Classification by Fuel Form

Reactors also are classified according to the type of nuclear fuel used or the form in which the fuel is supplied to the reactor.

Homogeneous Reactor — The homogeneous reactor uses a liquid rather than a solid fuel. The fuel is usually uranyl sulfate dissolved in water. Hence the fuel, moderator, and coolant are contained in one solution or slurry. This type of reactor is less expensive to build and operate than those using fabricated fuel elements.

Heterogeneous Reactor — In a heterogeneous reactor the core or fuel is supplied in solid form. Supplementary substances are needed to carry out the functions of moderating and cooling. The fuel is either machined into slugs and cladded with a protective metal or embeded in metal slugs or fuel elements. The preparation of the fuel in this form and its reprocessing are complicated and expensive. See Fig. 7.

Liquid-Metal-Fuel Reactor — The fuel in a liquid-metal-fuel reactor is supplied as a molten solution of uranium and bismuth. The molten metal passes through the reactor core where the nuclear reaction occurs and then passes through a heat exchanger in which steam is generated. This type of reactor is capable of operating at higher temperatures than the heterogeneous reactor, and reprocessing of the fuel is greatly simplified.

Aqueous Homogeneous Reactor — This type of reactor differs from the homogeneous reactor in that the moderator and coolant are separated from the fuel solution of uranyl sulfate and water. See Fig. 8.

Classification by Coolant

Another classification of reactors is according to the type of coolant used. Here there are six distinct types of reactors.

Pressurized Water Reactor — The pressurized water reactor is a heterogeneous reactor in which ordinary water, under high pressure, is used as both coolant and moderator. The water is kept at a pressure sufficiently high to avoid the generation of steam in the reactor core. The pressurized water leaving the core passes through a heat exchanger, where water at a lower pressure is generated into steam for use in a turbine. This type of reactor is used in the submarine Nautilus and in the Shippingport plant.

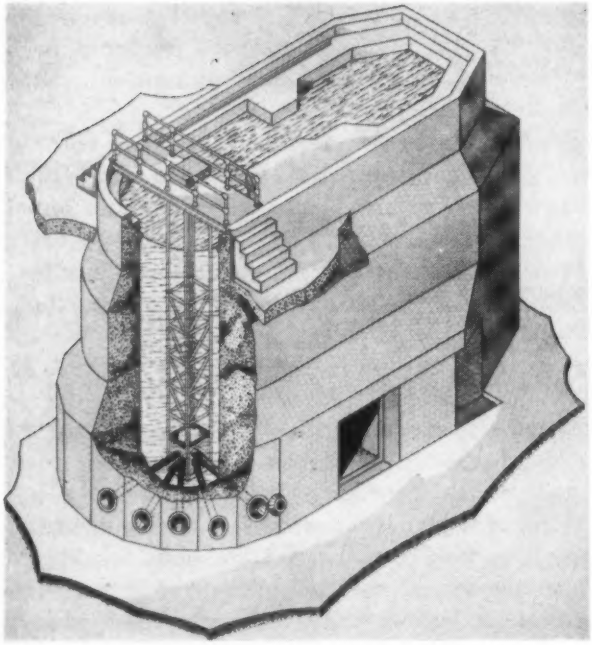


FIG. 9 — RESEARCH TYPE, SWIMMING POOL REACTOR.

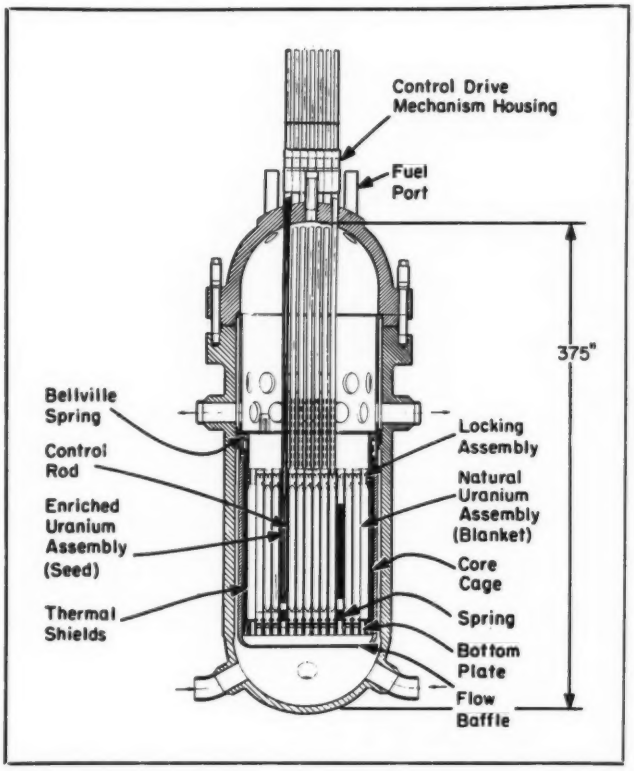


FIG. 10—DETAILS OF SHIPPINGPORT REACTOR VESSEL.

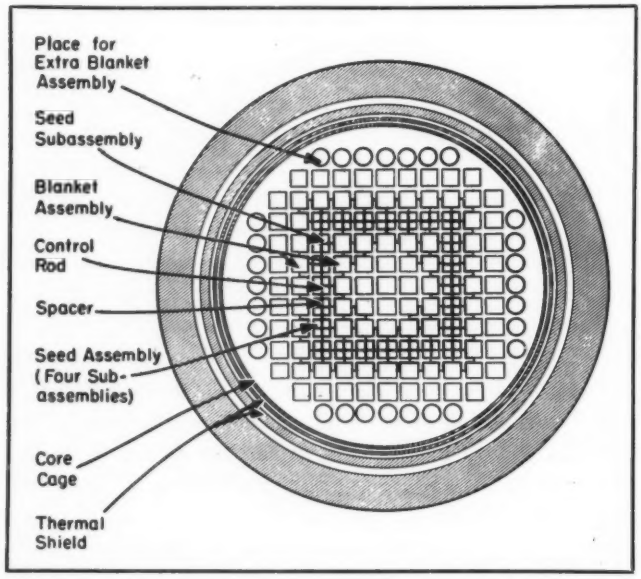


FIG. 11—CROSS SECTION, SHIPPINGPORT VESSEL & CORE.

Boiling Water Reactor — This type of reactor differs from the pressurized water reactor in that the reactor cooling water boils in the reactor core and steam is produced directly for use in the steam turbine of a power plant.

Sodium Graphite Reactor — The sodium graphite reactor uses liquid sodium or liquid sodium-potassium as a coolant and graphite as a moderator. Sodium, or sodium-potassium (NaK), offers the advantages of a high boiling point and good heat transfer. The coolant does not need to circulate at high pressures, and less coolant is needed. Hence the reactor design is simplified, and a smaller reactor is possible, since a smaller flow of coolant is needed. A heat exchanger is used to transfer heat from the reactor coolant to water, which is generated into steam for power purposes. The power plant of the submarine Seawolf makes use of a sodium graphite reactor.

Organic Moderated Reactor — This type of reactor uses such organic compounds as diphenal as both moderator and coolant. The organic moderator-coolants offer the advantages of a low-pressure system, low radioactivity pickup, and low corrosiveness. As a result, cheaper reactor materials can be used. This reactor is still in the development stage but gives good promise of reducing initial and operating costs.

Gas Cooled Reactor — Air, carbon dioxide, helium or other gases instead of water, organic compounds, or liquid metals such as sodium are used to cool this type of reactor. Development of this type of reactor has reached a point where a nuclear gas turbine power plant seems likely to be competitive with conventional steam power plants.

Swimming Pool Reactor — This is a low energy level research reactor in which the fuel elements are suspended in a pool of ordinary water. The pool of water acts as moderator, coolant, and a shield against radiation. This reactor is popular in educational institutions because of its low initial cost, low maintenance costs, and simple operation. See Fig. 9.

All of these reactors are thermal reactors, i.e., a moderator is used to slow down the neutrons. There is another type of reactor which is in a class by itself. The *fast breeder reactor* uses sodium as a coolant and an alloy of uranium and plutonium as a fuel, and no moderator is employed. The fast breeder reactor, in

contrast to the breeder reactor, is used primarily to produce fissionable material.

The Pressurized-Water Reactor

The technology of nuclear power has not yet been clearly established but the ultimate technology no doubt will be based on power plants currently under construction. This does not mean that any of the present designs will emerge as the most successful technically and economically. However, it is likely that the knowledge gained in the design, construction, and operation of the first nuclear power plants will have a profound influence on future designs.

The first successful nuclear power plant is of the pressurized-water type. That is, pressurized water is used as the reactor coolant and moderator. The submarine Nautilus has a pressurized-water nuclear power plant, and its recent completion of 50,000 miles of operation without refueling or technical difficulties is evidence of the success of this type of nuclear plant. The prototype of the Nautilus' nuclear power plant produced the first electricity ever obtained from nuclear energy during land-based tests. The first full-scale American nuclear power plant, at Shippingport, Pa., uses a pressurized-water reactor.

The pressurized-water reactor consists of a reactor vessel housing a core which is the active portion of the reactor. The reactor vessel of the Shippingport nuclear power plant is shown in Fig. 10. The over-all height of the reactor vessel is 33 feet and the inside diameter is approximately 9 feet. The nominal thickness of the wall is 8½ inches. The approximate dry weight of the reactor vessel is 250 tons. As seen in the drawing, the vessel has a hemispherical bottom and a bolted and flanged head which can be gasketed or seal-welded. The head is 10-in. thick and is reinforced to accommodate the 24 control rods and the 9 fuel ports. The vessel is designed for a pressure of 2500 psi.

High purity light water is used as both the coolant and moderator. This water, under a pressure of 2000 psi, is pumped by four, single-stage, centrifugal, canned-motor pumps into the four inlet nozzles located at the bottom of the reactor vessel. Four outlet nozzles are located in the cylindrical portion of the reactor shell immediately below the flange. The reactor vessel is supported by a neutron shield tank (not shown) at a point under the flange. The vessel is thermally insulated by 4 inches of glass wool with a density of approximately 9 pounds per cubic foot.

The Reactor Core

The reactor core is shown in longitudinal section in Fig. 10 and in cross-section in Fig. 11. The active part of the reactor core is a right circular cylinder having an average diameter of 6 feet and a height of 6 feet. The reactor core consists of highly enriched uranium-235 in seed assemblies and natural uranium, in the form of uranium oxide, in blanket assemblies. The seed assemblies, each made up of four subassemblies, contain a total of 114 pounds of uranium-235, and the blanket assemblies contain 12 tons of uranium oxide. Each of the seed subassemblies consists of plates welded to form a box. Four boxes then are welded, with spacers to maintain separation, to provide a central area of cruciform shape.

The control rods, which also are cruciform-shaped, are placed in these areas. They are made of crystal-bar hafnium. The blanket assemblies consist of rods in the form of Zircaloy-2 tubing filled with pellets of uranium oxide. The rods are assembled into bundles of 100, each bundle having a length of 10 inches. Seven of these bundles are stacked and mechanically fastened together to form an assembly. The ends of

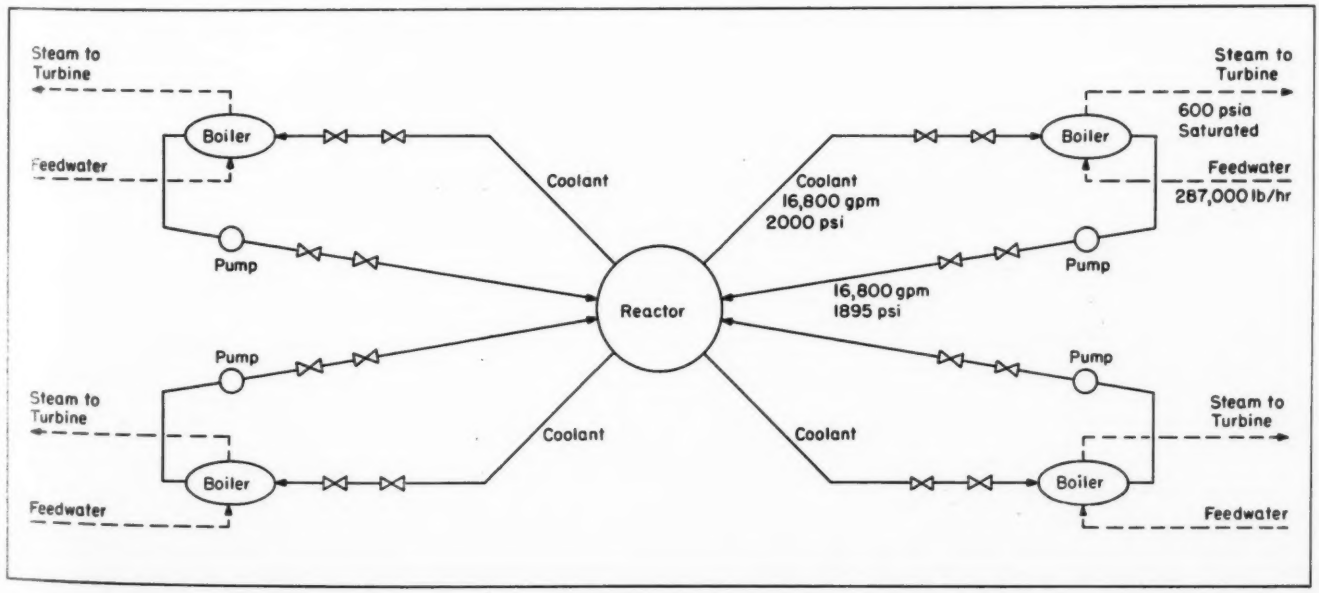


FIG. 12—SCHEMATIC DIAGRAM OF THE PRESSURIZED-WATER REACTOR AND BOILERS AT THE SHIPPINGPORT PLANT.

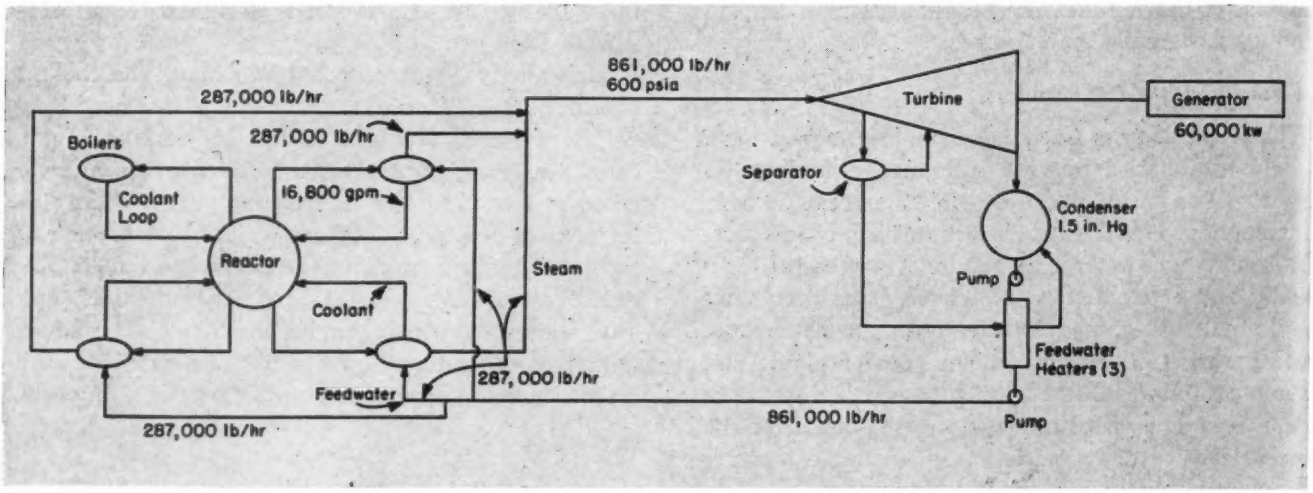


FIG. 13—SIMPLIFIED SCHEMATIC FLOW DIAGRAM INCLUDING TURBINE-GENERATOR SECTION, SHIPPINGPORT PLANT.

the tubes are welded to plates, and holes are drilled in these plates between the rods to permit the flow of cooling water. The blanket assemblies have orifices and flow baffles to encourage proper distribution and mixing of the cooling water.

Operation of the Reactor

The Shippingport pressurized-water reactor produces a minimum of 790,000,000 Btu per hour at full power rating. When the reactor is freshly charged with fuel, approximately 60 percent of the heat is produced in the blanket assemblies and 40 percent in the seed assemblies. The percentage of the total quantity of heat contributed by the blanket assemblies increases with time. Most of the heat comes from thermal fissioning of uranium-235, but approximately 8 percent comes from the fast fissioning of uranium-238, in addition to a substantial percentage contributed by the fissioning of plutonium.

The cooling water is pumped through the fuel assemblies at a pressure of 2000 psi and at a rate of approximately 45,000 gpm when the plant is operated at rated capacity. An additional 5400 gpm of water are required to cool the thermal shield and the walls of the reactor vessel. The reactor is provided with four main coolant loops supplying coolant to four steam boilers. At rated capacity only three of these loops are in operation, with 16,800 gpm of coolant flowing to each boiler, as shown in Fig. 12. The coolant leaves the reactor at a temperature of 542 F and at a pressure of 2000 psi, returning to the reactor at a temperature of 508 F and at a pressure of 1895 psi.

Two of the steam boilers are of straight tube, fixed tube-sheet design. These boilers are 36 feet in length and 43 inches in diameter. The other two boilers are of U-tube design and are 28 feet in length and 39 inches in diameter. The two different types of designs were selected to permit a diversified operating

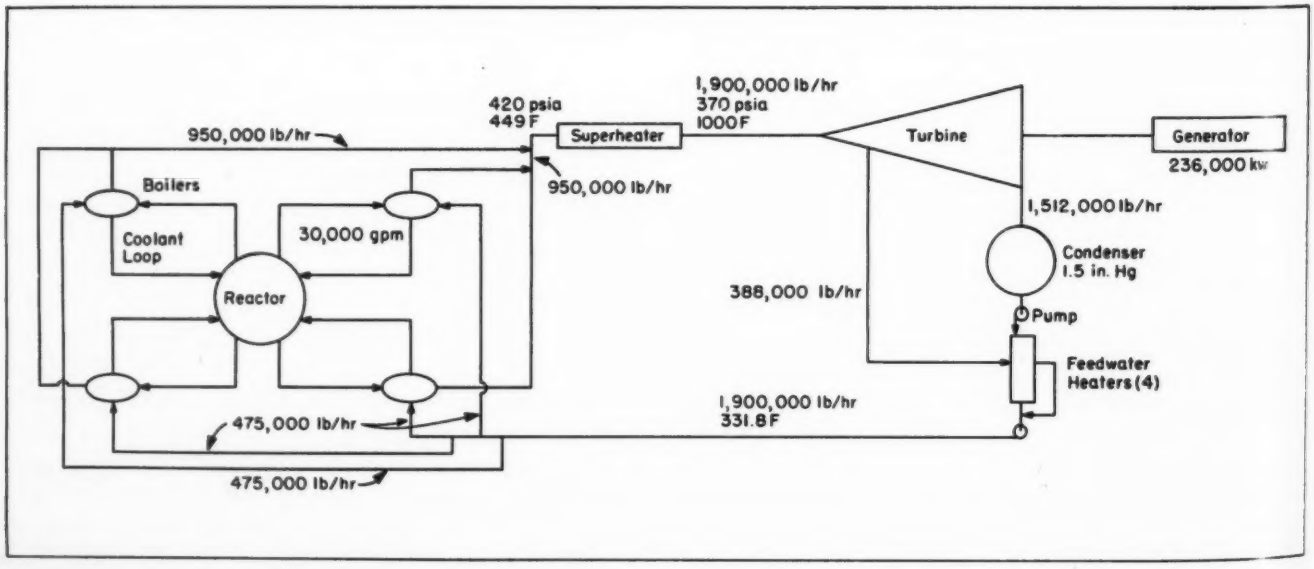


FIG. 14—SIMPLIFIED SCHEMATIC FLOW DIAGRAM OF INDIAN POINT PRESSURIZED-WATER NUCLEAR POWER PLANT.

experience upon which to base future designs. Each boiler has a rated capacity of 263-million Btu per hour, delivering saturated steam at a pressure of 600 psia at a rate of 287,000 lb per hour. With three boilers in operation at rated capacity, 861,000 lb per hour of saturated steam at a pressure of 600 psia are delivered to the turbine.

The Turbine-Generator Section

The non-nuclear portion of the Shippingport plant is not materially different from a conventional steam power plant. One exception is the introduction of a moisture separator at the second extraction point of the turbine. Since the steam is saturated at the throttle, the moisture content is approximately 10 percent by the time it reaches the second extraction point. The separator reduces the moisture content to approximately one percent. Fig. 13 shows a simplified schematic flow diagram of the plant. The station thermal efficiency at the rated output is expected to be 30 percent.

Other Pressurized Water Stations

In addition to the Shippingport nuclear power plant, two other large full-scale pressurized-water nuclear power stations are planned in the U.S. The first of these is the 236,000-kilowatt Indian Point Power Station, of Consolidated Edison Company of New York, expected to be in operation by May 1960. Babcock & Wilcox Company will furnish the reactor for this plant. The second power plant is the 134,000-kilowatt Yankee Atomic Electric Plant, of the Yankee Atomic Electric Company. This plant, which is still in the design stages, will be erected in New England. The reactor will be furnished by Westinghouse.

Indian Point Power Station

The Indian Point pressurized-water reactor differs from the Shippingport reactor in many details. An important difference is in the type of nuclear fuel used. In the Indian Point reactor, thorium highly enriched with uranium-235 is used. It is a convertor reactor in that the thorium is converted to fissionable fuel for use in the reactor. Another important difference is the addition of an oil-fired superheater, which increases the plant capacity from 140,000 kw (achievable with nuclear energy alone) to 236,000 kw.

The primary coolant system consists of four boilers, each of which is part of a separate coolant loop passing 120,000 gpm of coolant water. The coolant leaves the reactor at a temperature of 510 F and a pressure of 1500 psia and returns to the reactor at a temperature of 480 F. Feedwater enters the boilers at a rate of 1.9-million lb per hour at a temperature of 331.8 F and leaves as steam at 449 F and 420 psia. Steam leaves the oil-fired superheater at 1000 F and 370 psia. Fig. 14 shows a simplified schematic flow diagram of the plant at rated capacity of 236,000 kw at which point the thermal efficiency is expected to be about 32 percent.

An essential feature of the Indian Point nuclear power plant is that it is to be constructed entirely

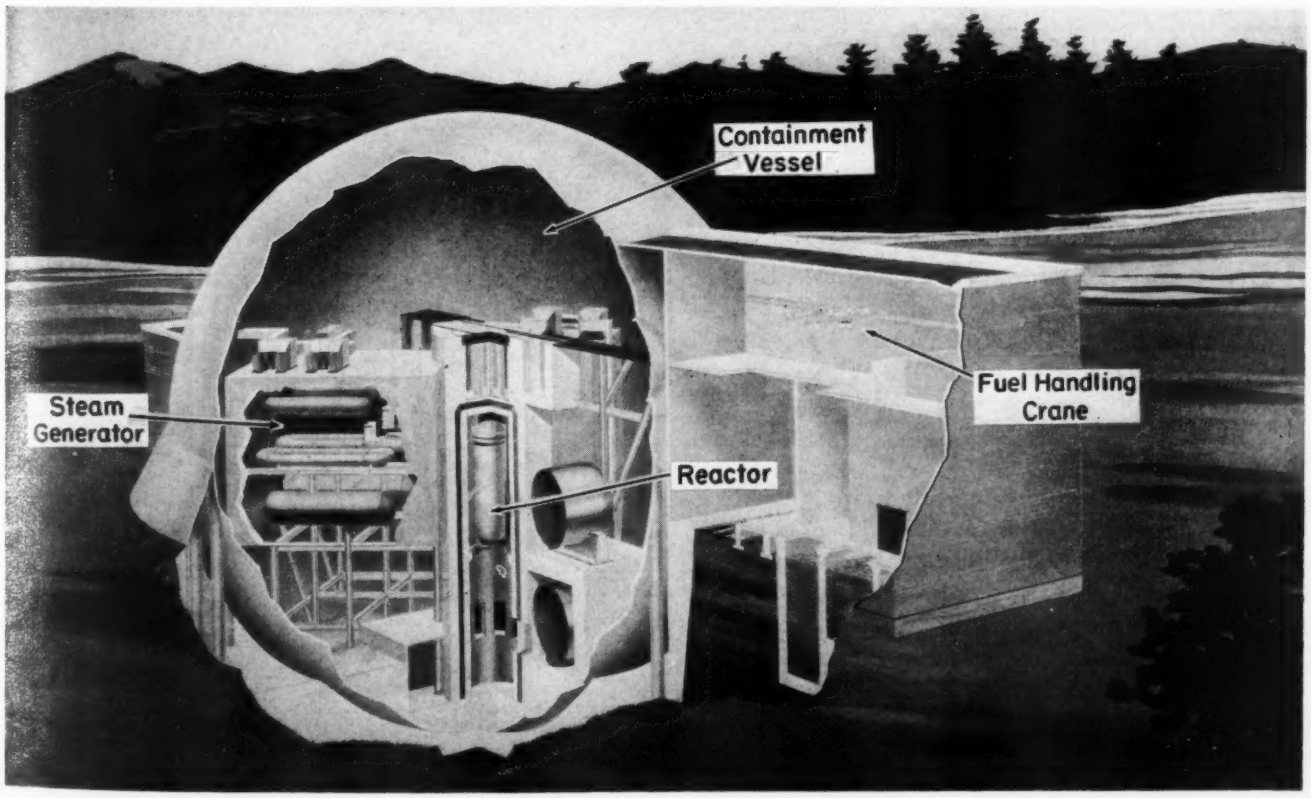


FIG. 15—CUTAWAY RENDERING OF CONSOLIDATED EDISON CO. NUCLEAR STEAM GENERATOR FOR INDIAN POINT, N.Y.

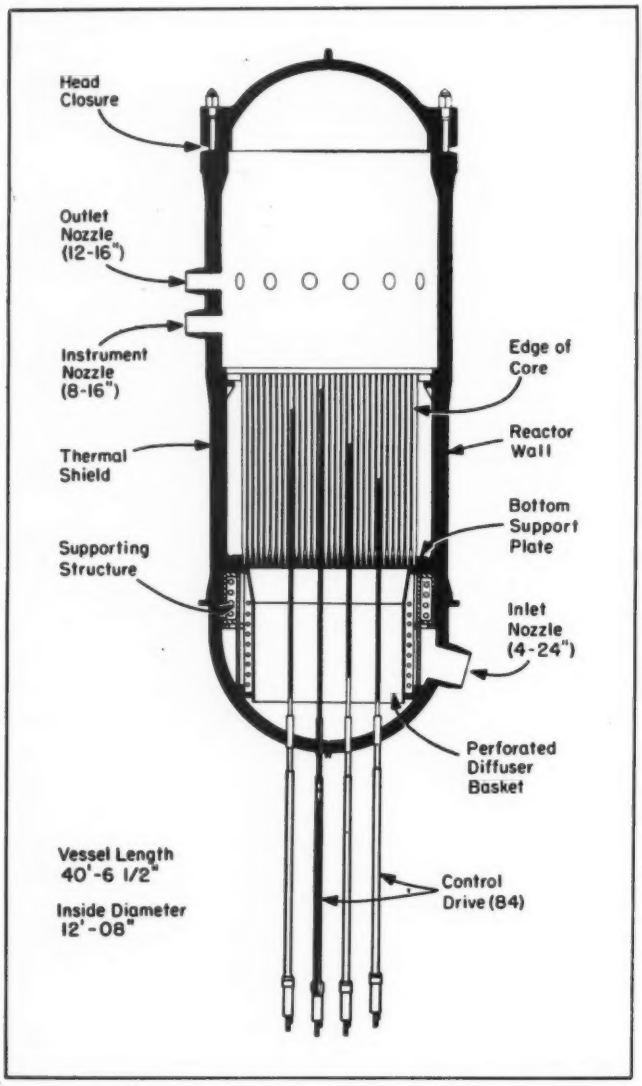


FIG. 16—LONGITUDINAL SECTION OF DRESDEN REACTOR.

with private funds. The cost per kilowatt of installed capacity is expected to be $233, as compared with $200 for a conventional plant and $322 for a similar nuclear power plant without the oil-fired superheater. The cost per kilowatt-hour produced (including fixed charges, operation and maintenance, and fuel charges at 80 percent load factor) is expected to be 8.88 mills. Fig. 15 shows a cutaway view of the nuclear reactor and the steam generating system.

The Boiling Water Reactor

The boiling-water reactor differs from the pressurized-water reactor in that steam is actually generated in the reactor core. Perhaps, "steam generating reactor" would be a more descriptive term for this type of reactor.

The boiling-water reactor is a logical development from the pressurized-water reactor, permitting the elimination of the separate boilers and a reduction of reactor system pressures. The capital costs are reduced and thermal efficiency is improved. However, there are some serious disadvantages, for a reactor in which the coolant changes to steam is inherently less stable than one in which the coolant remains a liquid. Another disadvantage is the exposure of the turbine, condenser, feedwater heaters, and pumps to radioactive steam or condensate. A true boiling-water reactor remains as an experimental type as typified by the Experimental Boiling Water Reactor recently put in operation at Argonne National Laboratory. Allis-Chalmers Manufacturing Company recently announced the development of a modified boiling-water reactor called the Controlled Recirculation Boiling Reactor. Another modification of the boiling-water reactor, known as the Dual-Cycle Boiling Reactor, will be incorporated in the Dresden Station of Commonwealth Edison Co., of Chicago.

Dual-Cycle Boiling Reactor

The dual-cycle boiling reactor was developed by General Electric Company to take advantage of the simplifications offered by the boiling-water reactor and yet insure greater stability. In the dual-cycle reactor approximately 10 percent of the water passing through the reactor is generated into steam. The water not evaporated in the reactor is flashed into steam at a lower pressure and introduced into the turbine at a later stage. Since such a large percentage of the water passing through the reactor is liquid, the stability of the reactor is greatly improved, and the liquid provides for higher heat transfer rates than would be possible if all the water were generated into steam in the reactor. Despite these advantages

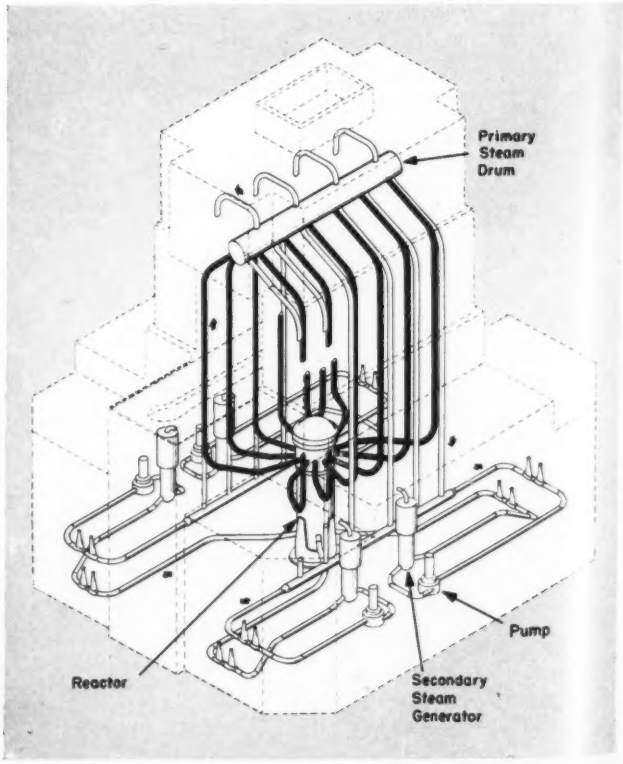


FIG. 17—ISOMETRIC FLOW DIAGRAM OF DRESDEN PLANT.

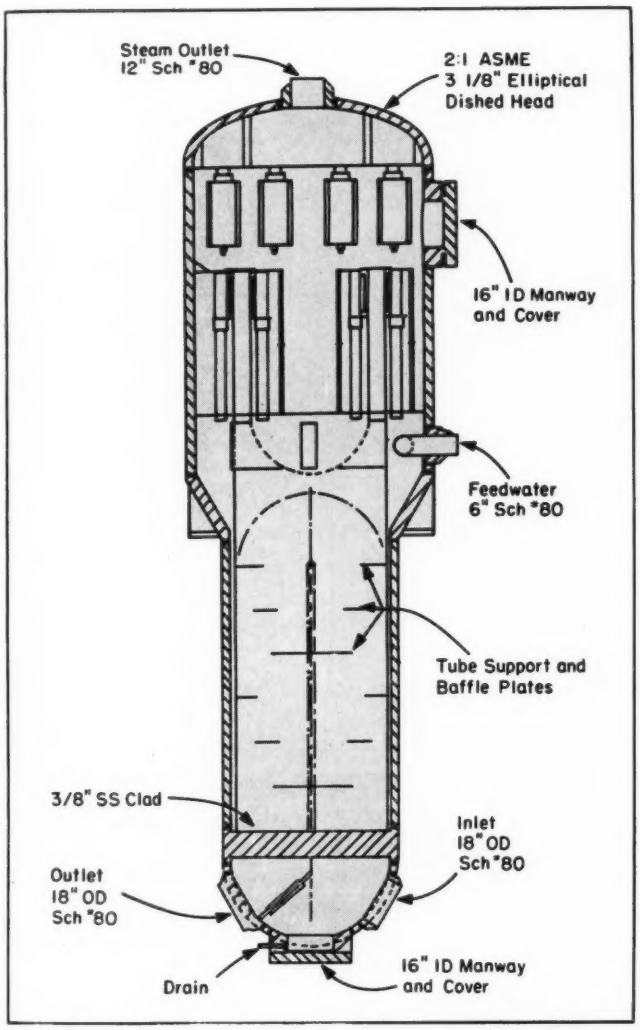


FIG. 18—SECONDARY STEAM GENERATOR, DRESDEN PLANT.

Dresden Station will cost approximately $250 per kilowatt of capacity as compared with a cost of $167 per kilowatt for a conventional plant.

Fig. 16 shows a longitudinal section of the reactor core and vessel. The reactor core is a honeycomb structure consisting of 3¾-in. square Zircaloy channels. Those channels containing control rods have 16 fuel rods and those without control rods have 25 fuel rods. The fuel is slightly enriched uranium dioxide sintered and formed as a cylindrical pellet. These pellets are clad in Zircaloy to form tubular fuel rods.

The reactor vessel is 40-ft high and has an inside diameter of 12 feet with a shell thickness of 5½ inches. The shell is constructed of ASTM A-302 steel. As seen in Fig. 16, the vessel contains and supports the core assembly. The head closure permits the complete removal of the core if necessary. Four, 24-in. inlets admit coolant, and wet steam leaves through 12, 16-in. outlets near the top of the vessel.

The Vapor Cycle

The reactor package is shown in Fig. 17. Cooling water enters the inlet nozzles at the bottom of the reactor vessel, flows upward through the fuel channels, and leaves as wet steam through the outlet nozzles near the top of the vessel. The wet steam and liquid coolant then flow to a primary steam drum located above the reactor vessel where the moisture is removed and the dry steam goes to the turbine throttle. The liquid coolant moves from the primary steam drum to four secondary steam generators where condensate returning from the feedwater heating system is generated into steam at a pressure lower than that of the primary steam. The secondary steam then is admitted to the turbine, which is of the dual-admission type. Condensate from the primary steam is sent directly to the reactor while condensate from the secondary steam is returned to the secondary steam generators.

The primary steam drum provides for approximately 1700 cubic feet of water storage and serves as a reservoir and steam separator. It is 60-ft long and has a diameter of 8½ feet. The secondary steam generator is shown in Fig. 18. The liquid coolant from the primary steam drum is pumped through inverted

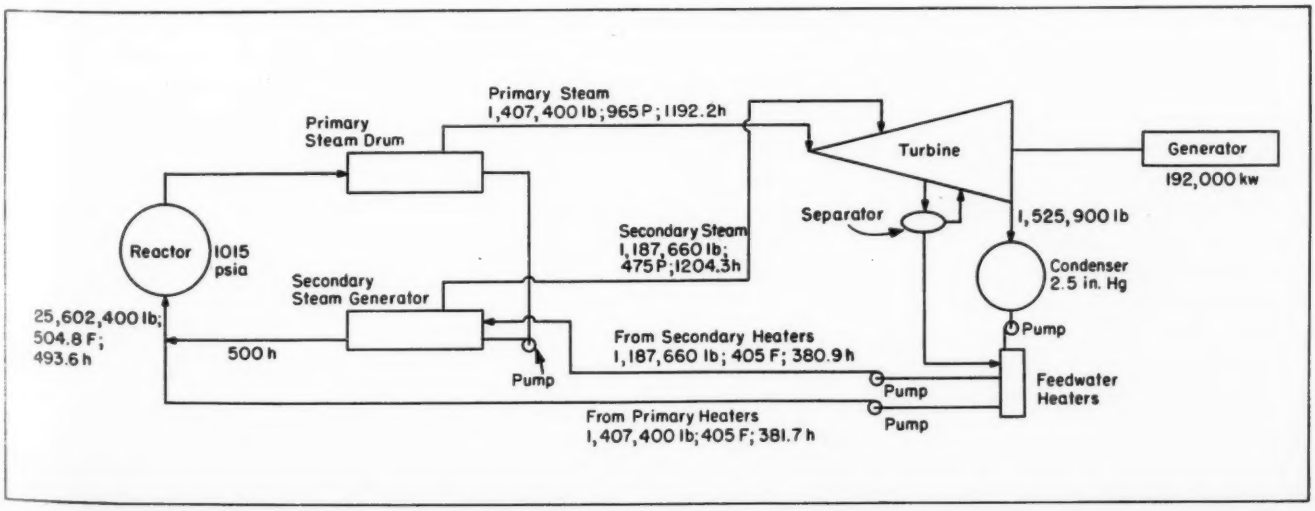


FIG. 19—SIMPLIFIED SCHEMATIC FLOW DIAGRAM OF DUAL-CYCLE REACTOR POWER PLANT FOR DRESDEN STATION.

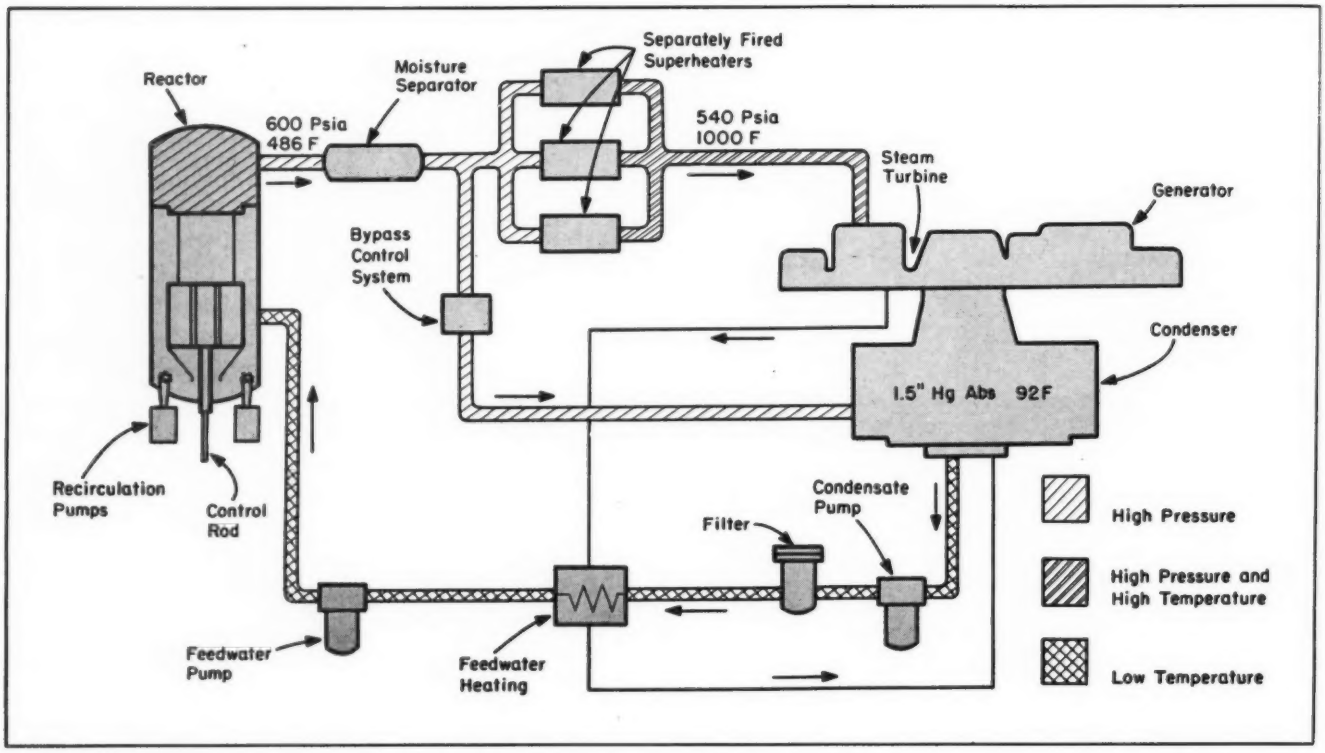


FIG. 20—SYSTEM DIAGRAM OF BOILING WATER REACTOR NUCLEAR POWER PLANT FOR NORTHERN STATES POWER CO.

U-tubes. Steam is generated and separated in the cylindrical shell.

Dual-Cycle Reactor Operation

Fig. 19 shows a simplified flow diagram for the Dresden Station dual-cycle reactor power plant. Water flows through the reactor at a rate of 25,602,400 lb per hr at a pressure of 1015 psia when the station output is 192,000 kilowatts. Steam and water leave the reactor at a pressure of 1015 psia and pass to the primary steam drum where some of the water flashes to steam at a pressure of 990 psia to supplement the steam generated in the reactor. The steam is separated from the liquid water in the primary steam drum and 1,407,400 lb per hr pass to the throttle of a dual-admission turbine at a pressure of 965 psia and a quality of approximately two percent. The remaining 24,195,000 lb per hr of water at a temperature of 543 F pass to the secondary steam generators. Feedwater from the secondary feedwater heaters flows at a rate of 1,187,660 lb per hr and at a temperature of 405 F to the secondary steam generators, emerging as nearly saturated steam at a pressure of 475 psia. This secondary steam then is admitted to the turbine at the secondary admission point.

Feedwater from the primary feedwater heaters at a rate of 1,407,400 lb per hr and a temperature of 405 F is joined by the coolant emerging from the secondary steam generators at a rate of 24,195,000 lb per hr. This makes a total flow to the reactor of 25,602,400 lb per hr at a temperature of 504.8 F. The turbine is equipped with a moisture separator which reduces the moisture content from approximately 10 percent to approximately two percent.

Although the generator develops 192,000 kilowatts, about 12,000 kilowatts are required for operation of the station, making a net station output of 180,000 kilowatts. Based on the net output the plant thermal efficiency is 28.7 percent.

Controlled Recirculation Boiling Reactor

Allis-Chalmers Manufacturing Company will build a controlled circulation boiling reactor for a 60,000-kilowatt nuclear power plant for Northern States Power Company. It is estimated that the cost will be $20 to $25 million.

A feature of this type of boiling water reactor is its high energy output per unit of volume. The cylindrical core, measuring five feet by five feet, will generate as much heat (133 megawatts) as a boiler burning about 20 tons of coal per hour. This is possible because of the large volume of water being recirculated through the reactor. The reactor operates at a pressure of 600 psi. The heat from the nuclear reaction boils water to produce saturated steam at a temperature of 486 F. The steam flows through superheaters directly to the turbine. The superheaters, fired with conventional fuel, increase the temperature of the steam to 1000 F at 540 psi. Fig 20 shows a schematic diagram of that controlled circulation boiling reactor power plant.

The reactor vessel itself is nine feet in diameter and 23-ft high and is housed in a steel and concrete building approximately 45 feet in diameter and 70-ft high.

The steam turbine-generator unit is housed in a conventional building. The presence of water within the reactor core is essential to keep the nuclear chain reaction going. Any excess heat generated by the fission process causes an increase in the amount of steam within the reactor, displacing the water and causing the reaction to slow down. The reactor power is adjusted by controlling the rate of water recirculation through the reactor core. This is accomplished by large pumps located at the bottom of the reactor. The water carries along the steam produced by the heat of the nuclear reaction, and the steam bubbles are separated centrifugally. After the energy in the steam is utilized in driving the turbine, the exhaust steam is condensed and returned to the reactor.

If greater steam output is desired from the reactor, the speed of the recirculation pumps are increased by automatic control. This forces out additional steam from the reactor core, causing the power output to increase to a new level. If power demand decreases, the pumps will slow down, reducing the quantity of steam removed from the reactor core, thus slowing down the reaction rate.

Fast Breeder Power Plant

The fast breeder power reactor offers the advantage of using abundant low-cost uranium-238 and thorium as fuel. Utilizing high-energy fast neutrons for the fission process, it is possible to produce more fissionable nuclear fuel than is consumed. It is even conceivable that it might achieve negative fuel costs. However, there are two important disadvantages: a larger reactor is required, and radiation damage of the fuel elements reduces their life.

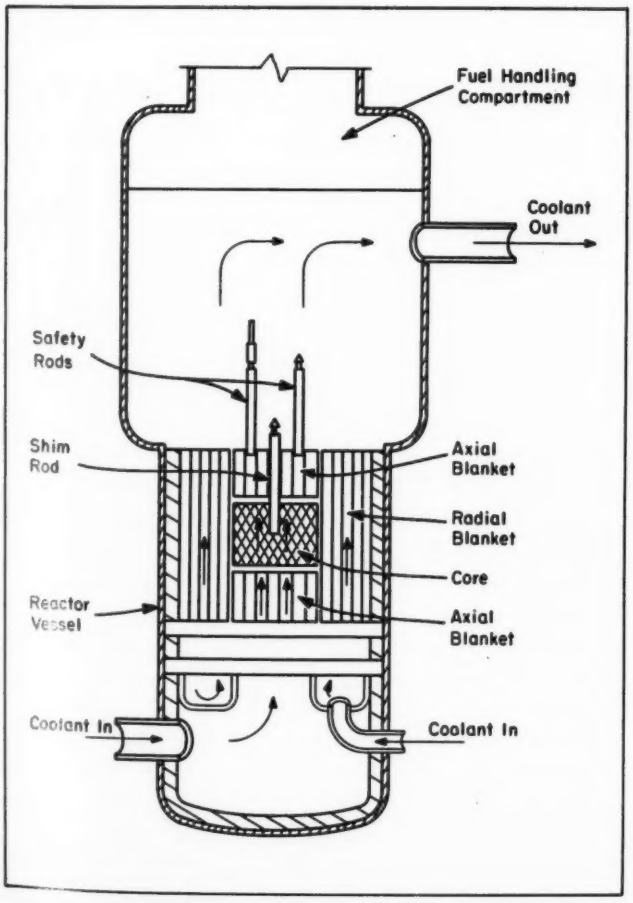


FIG. 21—FAST BREEDER REACTOR CORE ARRANGEMENT.

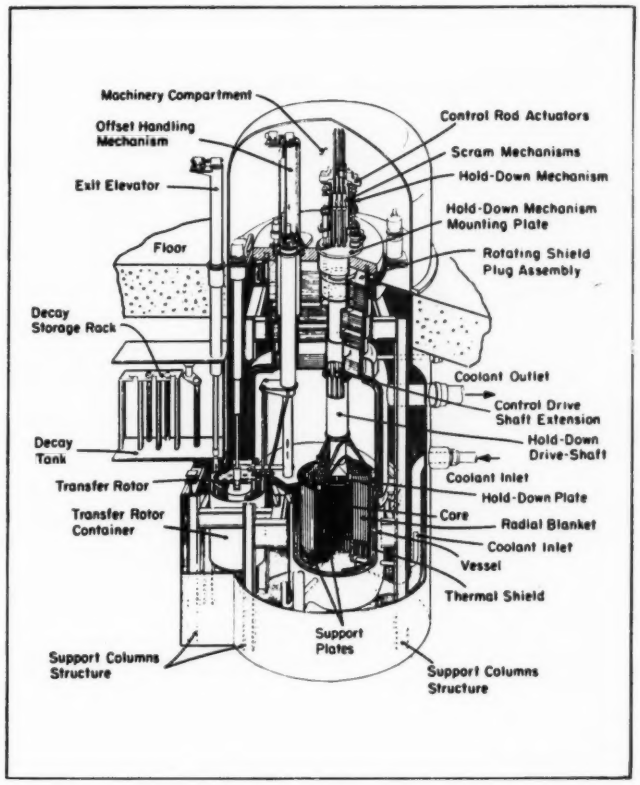


FIG. 22—ACTUAL COMPONENTS, FAST BREEDER REACTOR.

The liquid-metal-cooled or sodium-graphite power reactor utilizes a liquid metal, such as liquid sodium, as the reactor coolant. Graphite is used as the moderator. The advantage of this type of reactor is higher plant thermal efficiency resulting from higher coolant temperature. The reactor is likely to be large because of the graphite moderator, and the difficulties associated with handling molten sodium pose a serious disadvantage.

First Fast Breeder

The first nuclear power plant incorporating a fast breeder reactor will be built near Monroe, Michigan, by Power Reactor Development Company as part of the Detroit Edison Company's system. The plant, to be known as The Enrico Fermi Nuclear Power Plant, will have a capacity of 156,000 kilowatts and will cost a total of $54,572,000 including $9 million for research and development.

The reactor arrangement is shown schematically in Fig. 21. The core is relatively small — 30.5 inches in diameter and 30.5 inches in length with a volume of 11.7 cubic feet. The fuel elements consist of an alloy of uranium-238 and molybdenum enriched with uranium-235. The core consists of 91 subassemblies,

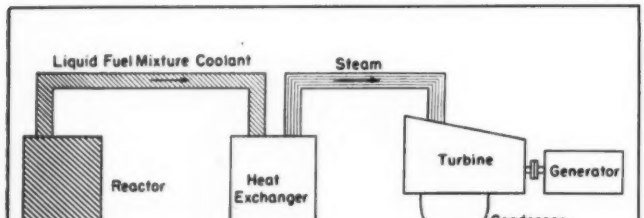


FIG. 23 — SCHEMATIC DIAGRAM OF SINGLE-REGION, SLURRY TYPE OF AQUEOUS HOMOGENEOUS REACTOR.

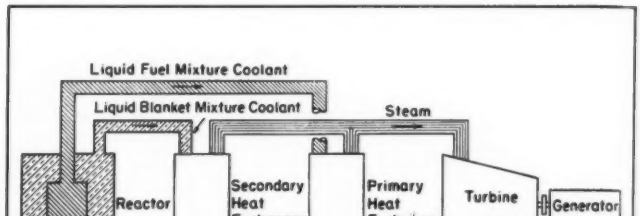


FIG. 24 — SCHEMATIC DIAGRAM OF A TWO-REGION, SLURRY TYPE OF AQUEOUS HOMOGENEOUS REACTOR.

each subassembly containing 144 pin-type fuel elements arranged on a square pitch of 0.1917 inches. There are 10 control rods, supplemented by 8 safety rods, all of boron carbide enriched with the boron-10 isotope.

The core is surrounded by a radial blanket of unalloyed uranium-238 made up of 546 subassemblies. Over-all, the blanket is 80-in. diameter and 70-in. high. As shown in Fig. 21 the core is positioned between upper and lower axial blanket sections. Liquid sodium coolant flows upward through both the core and radial blanket assemblies. Approximately 7 percent of the coolant passes through the radial blanket assemblies, 3 percent through the control rod assemblies and thermal shield, and the remaining 90 percent through the core and radial blanket. Since this is a fast reactor, no moderator is provided.

Fig. 22 shows the arrangement of the actual components in the reactor vessel, which is 14-ft high, 10 feet in diameter and 1.5-in. thick. The vessel is provided with three, 14-in. coolant inlet nozzles for the core; three, 6-in. coolant inlet nozzles for the radial blanket; and three, 30-in. coolant outlet nozzles. The total mass flow rate of sodium coolant is 13,200,000 lb per hr entering the reactor vessel at a temperature of 550 F and leaving at a temperature of 800 F.

Fast Breeder Operation

Liquid sodium leaves the reactor and flows to an intermediate heat exchanger where a secondary fluid consisting of a liquid alloy of sodium-potassium receives heat from the coolant. The secondary fluid then flows to a boiler in which water is generated into steam. Since the sodium coolant is radioactive and reacts violently with water, a secondary fluid is used to minimize the danger of a leak in the boiler. The sodium coolant enters the intermediate heat exchanger at 800 F and leaves at 550 F, flowing at a rate of 13.2-million lb per hour. The sodium-potassium alloy (NaK) enters the intermediate heat exchanger at a temperature of 500 F and leaves at 750 F, flowing at a rate of 16.1 million lb per hr. Feedwater enters the boiler at a temperature of 400 F and at a pressure of 600 psi and leaves as superheated steam at a temperature of 730 F. Steam is generated at a rate of 1,015,000 lb per hr.

The turbine-generator section of the plant is of conventional design. With the steam conditions described, the station output is 100,000 kilowatts with a thermal efficiency of 30 percent. After a two-year period of operation it is expected that the coolant temperature leaving the reactor can be increased to between 900 and 1000 F permitting steam conditions of 900 psia and 820 F and a steam flow rate of 1,470,000 lb per hr. The turbine and all the auxiliaries will be designed for that operating level.

Aqueous-Homogeneous Power Plant

The aqueous homogeneous power reactor has the advantages of lower cost and simpler construction. The moderator, coolant, and fuel constitute a homogeneous liquid mixture, thus eliminating the need for elaborate fabricated fuel elements. It would appear to be possible to reprocess the fuel on a continuous basis. Perhaps the outstanding advantage of this kind of reactor is its stability. Some of the disadvantages include difficulties associated with keeping the fuel in solution and corrosion resulting from the fact that the solution is acid.

The first aqueous-homogeneous nuclear power plant will come from the Pennsylvania Advanced Reactor Project, a joint venture of Westinghouse Electric Corporation and Pennsylvania Power and Light Company. Out of this project will come the design for a reactor for a 150,000-kilowatt nuclear power plant expected to be in operation in eastern Pennsylvania by 1962.

In the homogeneous reactor the fuel, moderator, and coolant are mixed in a single homogeneous liquid mixture. An aqueous-homogeneous reactor uses either light or heavy water as a moderator in which a fissionable material is carried either in solution or in suspension. There are four types of aqueous-homogeneous reactors. In the simple burner type, the

fuel is highly enriched uranium-235 as a solution of uranyl sulfate. This type of reactor is used for research purposes but since highly enriched fuel is used, the fuel costs would be prohibitive for power plants. The second type, known as a heavy solution reactor, uses an extremely high concentration of uranyl sulfate with uranium-238. This type of reactor is a thermal breeder in that the fission neutrons captured by the uranium-238 convert it to the fissionable material plutonium. The breeding feature of this reactor would make the fuel costs attractive, but unfortunately the heavy solution is highly corrosive and is not stable at reactor temperatures.

Other Homogeneous Reactors

The other two types of homogeneous reactors are the single-region slurry type and the two-region slurry type. In the single-region reactor a quasi-homogeneous suspension or slurry consisting of uranium-233 and water in solution and a suspension of thorium oxide is used. The uranium-233 is converted to thorium-232 upon capture of a neutron so that this reactor is a thermal breeder. The two-region reactor differs from the single-region type in that it is composed of a core of highly enriched uranyl sulfate surrounded by a circulating liquid blanket of thorium oxide slurry separated by a core liner.

Fig. 23 shows a schematic diagram of a single-region reactor and Fig. 24 shows a similar diagram for a two-region reactor. Both of these types are being studied as part of the Pennsylvania Advanced Reactor Project. The principal advantages of these reactors over the heterogeneous types are lower capital investment, elimination of heat transfer surfaces in the reactor, more efficient use of neutrons with the elimination of structures in the reactor core and blanket, high stability, and continuous reprocessing of fuel without shutdown. Among the disadvantages are the problems of the intense radioactivity of the fuel circulated through a major portion of the reactor plant, abrasiveness of slurry particles, difficulty of pumping a quasi-homogeneous mixture, and the tendency for the suspended solid particles to settle out. These problems are receiving the concentrated attention of the personnel associated with the Pennsylvania Advanced Reactor Project.

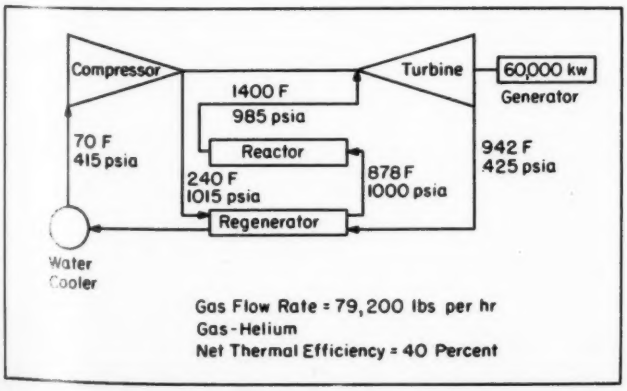


FIG. 25 — SCHEMATIC FLOW DIAGRAM OF 60,000-KILOWATT NUCLEAR GAS TURBINE POWER PLANT.

Gas Turbine Power Reactors

Several gas-cooled reactors for nuclear gas turbine power plants have been proposed, but no immediate plans for the construction of this type of plant have materialized. A program for the development of gas-cooled reactors was initiated in this country in 1944 but was abandoned in 1947 in favor of developing other types of reactors. The recent successes of the British and French with gas-cooled reactors has revived interest here.

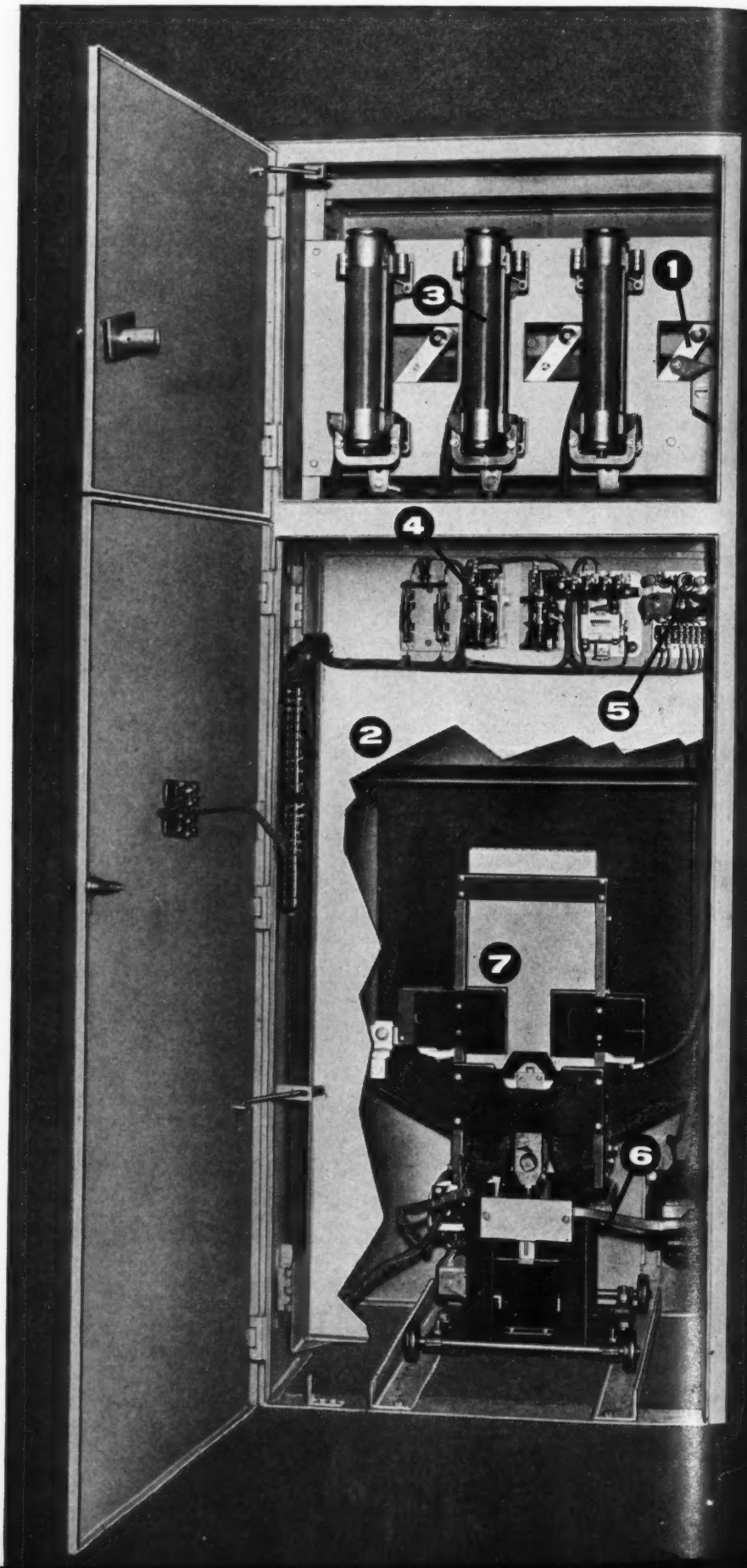
A gas-cooled reactor is of the heterogeneous type utilizing graphite or beryllium oxide as a moderator and a gas as a coolant. The gas coolant can be expanded directly in a gas turbine or an intermediate heat exchanger can be used. Since gas turbine power plants must have turbine inlet temperatures in excess of 1200 F to operate effectively, serious demands are made on the reactor technology. This means that the temperature in the reactor must be considerably higher than 1200 F and local hot spots undoubtedly would melt the metallic materials used in the reactor core. If an inert gas coolant, a graphite moderator, and uranium-carbide fuel elements are used, it is theoretically possible to raise the maximum reactor temperature to 3600 F or higher. By pressurizing the gas coolant, effective cooling can be achieved with reasonable reactor size.

All of the above considerations point to a closed-cycle gas turbine as shown diagrammatically in Fig. 25. Helium, nitrogen, or carbon dioxide can be used as both reactor coolant and cycle fluid. Uranium-carbide, used as the fuel, can be sheathed in reactor-grade graphite, which acts as a moderator and structural material. The closed-cycle offers the obvious advantage of not discharging radioactive gases to the atmosphere.

The most impressive advantages of the nuclear gas turbine power plant are low initial cost and high efficiency permitted by higher reactor temperatures achieved through the use of an inert coolant. Another extremely important advantage is elimination of condenser water in the large quantities and at the low temperatures required for steam plants. There are, of course, some technological uncertainties in the reactor design — the problem of maintaining equipment exposed to radioactive gases and the need for an absolutely leakproof system. However, none of these problems are insurmountable, and many of them are shared by the nuclear steam power plants.

It seems very likely that the nuclear gas turbine power plant will emerge as one of the most important types of nuclear power plant. Its development has been retarded because the major effort has been devoted to the design of nuclear steam power plants using reactors and turbogenerators. ▲▲

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6

Mechanical interlock coordinates contactor, disconnect switch, upper door and inner control barrier for maximum safety.

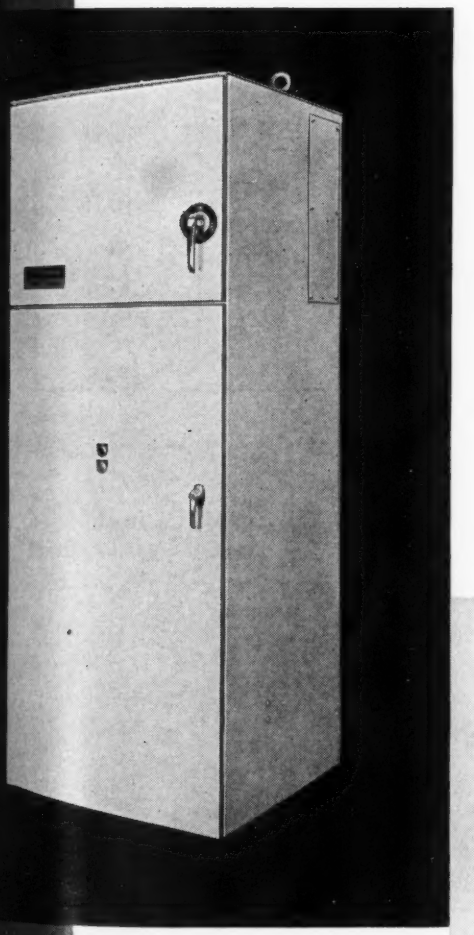
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Roll-out contactor makes maintenance easy—even in narrowest aisle space. (Routine inspection and maintenance can be done with contactor in place.)

Designed

Type H High Voltage Motor Control

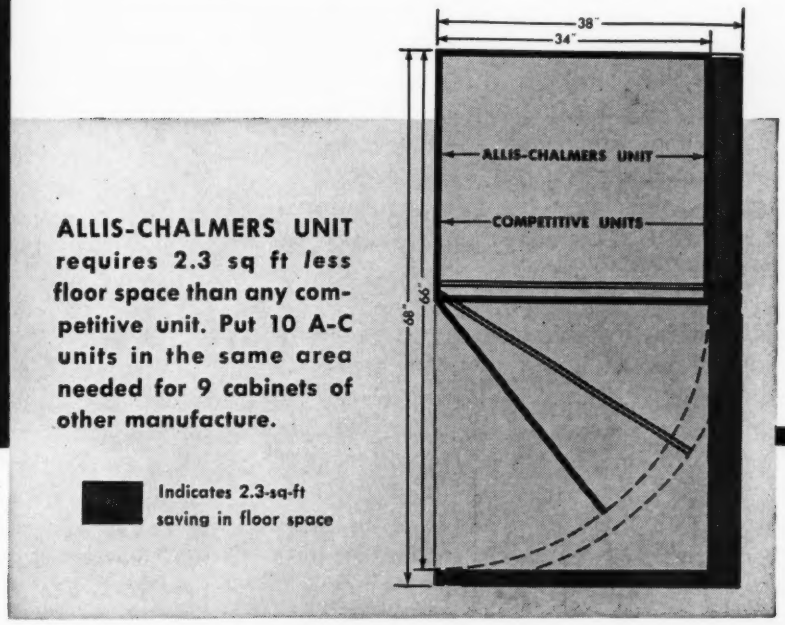
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Here is control that couples compactness with roominess (for ease of maintenance) . . . here is a starter that joins test-proven performance with versatility (for addition of meters and relays) — AND the line meets every 2300 to 5000-volt motor need.

For more information on this engineering advance, contact your A-C representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.



ALLIS-CHALMERS UNIT requires 2.3 sq ft *less* floor space than any competitive unit. Put 10 A-C units in the same area needed for 9 cabinets of other manufacture.

Indicates 2.3-sq-ft saving in floor space

ALLIS-CHALMERS

A-5517

Multiplication by the "Half - Double" Method

LEONARD M. MAJESKE, P.E.
Consulting Engineer

DESIGNERS OF COMPUTING machines, calculators, data recorders, and similar equipment frequently use numbering systems other than the conventional decimal system with which we are all familiar. Some commonly used systems include the pure binary, cyclic binary, binary coded decimal, sexadecimal, and others.

The most basic of these, the pure binary, utilizes just two characters, the (1) and the (0) in contrast to the ten characters used in the decimal system. Counting in the pure binary system is similar to the decimal system in that the next higher number is one more than the previous, with carry-overs to digits to the left. Table 1 compares numbers in the binary system with corresponding numbers in the conventional decimal system.

At first glance, this looks like a more cumbersome system than the decimal system. However, let us pick out the numbers which are powers of (2) as shown in Table 2.

Any number in the decimal system can be shown to be the sum of certain of the numbers in the sequence 1, 2, 4, 8, 16, 32, 64. . . These numbers are respectively sequential powers of (2) as for example, $1 = (2)^0$, $2 = (2)^1$, $4 = (2)^2$, $8 = (2)^3$, $16 = (2)^4$, $32 = (2)^5$, $64 = (2)^6$ . . . The number 43, for example, is equal to $32 + 8 + 2 + 1$, each of the latter numbers being some power of (2) multiplied by a coefficient which is either (1) or (0).

In expanded form, the number 43 can be written as:

$$43 = 1(2)^5 + 0(2)^4 + 1(2)^3 + 0(2)^2 + 1(2)^1 + 1(2)^0$$
$$= 32 + 0 + 8 + 0 + 2 + 1 = 43$$

The same number (43) can be shown in binary form to be the sum of binary numbers which are in turn sequential powers of (2).

TABLE 1

Decimal Number	Pure Binary	Decimal Number	Pure Binary
0	0	35	100011
1	1	36	100100
2	10	37	100101
3	11	38	100110
4	100	39	100111
5	101	40	101000
6	110	41	101001
7	111	42	101010
8	1000	43	101011
9	1001	44	101100
10	1010	45	101101
11	1011	46	101110
12	1100	47	101111
13	1101	48	110000
14	1110	49	110001
15	1111	50	110010
16	10000	51	110011
17	10001	52	110100
18	10010	53	110101
19	10011	54	110110
20	10100	55	110111
21	10101	56	111000
22	10110	57	111001
23	10111	58	111010
24	11000	59	111011
25	11001	60	111100
26	11010	61	111101
27	11011	62	111110
28	11100	63	111111
29	11101	64	1000000
30	11110	65	1000001
31	11111	66	1000010
32	100000	67	1000011
33	100001	68	1000100
34	100010	69	(etc)

Addition of Binary Numbers

From Table 1, we see that 43 = 101011. In the expanded form of 43 previously shown we see that corresponding binary components from Table 2 are:

32	100000
0	0
8	1000
0	0
2	10
1	1
43	101011

When these are added together, the sum 101011 is obtained as before. The above addition is performed just as in conventional arithmetic. However, when two binary numbers are added so as to produce a "carry-over" digit, the deviation from conventional arithmetic consists in the fact that only two characters are used. Thus, to add binary numbers such as

11 = 3		10110 = 22
+ 101 = 5	or	+ 11101 = 29
1000 = 8		110011 = 51

the "carry-over" is added to the next column of figures on the left. Remember that 1 + 1 is not 2, but is equal to 10.

Multiplication of Binary Numbers

Multiplication of binary numbers is similar to conventional multiplication but is much simpler. All that need be remembered is: $1 \times 1 = 1, 0 \times 1 = 0$, and $0 \times 0 = 0$. In the decimal system a long, complicated multiplication table must be memorized. To illustrate, consider the following examples of multiplication in binary form:

Multiply 6×8		Multiply 7×9
1000		1001
× 110		× 111
0000	or	1001
1000		1001
1000		1001
110000 = 48		111111 = 63

To double any binary number, simply add "0" to the right of the number. Thus, $10 \times 111 = 1110$. Conversely, to halve an even binary, simply remove the final "0."

Application of Binarys to Decimals

Suppose it is desired to multiply two numbers in the decimal system using the "half-double" method. Although the method works for any combination of numbers, we will choose a pair of simple numbers to illustrate the example, namely 43×67. The procedure is to half the first and double the second neglecting the remainders until unity is obtained in the left column. The numbers are arranged side by side in vertical columns, then the rows with even numbers in the left column are cancelled out. The remaining numbers in the right column then are added to give the final product. Thus:

43	× 67		67
21	134		134
10	268		—
5	536		536
2	1072		—
1	2144		2144
			2881

To check the accuracy of the result, we multiply as in the conventional manner.

```
  67
× 43
 201
268
2881
```

Does the method work for large numbers as well? Let us try two, 3-digit numbers, such as 123×456.

123	× 456	456	Check,	456
61	912	912		× 123
30	1824	—		1368
15	3648	3648		9120
7	7296	7296		45600
3	14592	14592		56088
1	29184	29184		
		56088		

TABLE 2

Decimal Number	Pure Binary
0	0
1	1
2	10
4	100
8	1000
16	10000
32	100000
64	1000000

The extra zeros are added in the check by conventional multiplication to illustrate the idea that when we multiply by the 2 we are really multiplying by 20, and when we multiply by the 1 we are really multiplying by 100.

Why it Works

Now that we have shown that the system works, can we figure out why it works? We can explain it from the principles of the binary number system. This time take a very simple problem, for example say the multiplication of 13×17:

13	× 17	17	Check,	17
6	34	—		× 13
3	68	68		51
1	136	136		17
		221		221

Now, do the multiplication in binary form.

1101	× 10001 ...	10001	Check,	10001
110	100010 ...	——		× 1101
11	1000100 ...	1000100		10001
1	10001000 ...	10001000		00000
		11011101		10001
				10001
				11011101

Observe that the two columns of numbers which we total to get the answer are identical. This indicates that the respective rows of numbers in the "half-double" multiplication are actually the products of the successive integers in the multiplier. Consequently, it is evident that the "half-double" method of multiplying conventional numbers is simply binary multiplication. ▲▲





Year End Tax Planning

CARL H. RISTAU, C.P.A., Kovtan & Ristau

THE WEEKS REMAINING until December 31st will give you time to review your potential 1957 federal income tax liability and perhaps make some tax savings. Remember, however, that there is a paradox involved. A decrease in your current tax payment does not always result in an ultimate savings. You might be better off if you took steps to increase your 1957 tax.

To understand how this could be, look at the situation of a consulting engineer firm, operating as a sole proprietorship, which attained an income in 1956 of $18,000, and in 1957 of $30,000. The owner is married, has one dependent, and uses the standard deduction. His tax was $3680 for 1956 and will be $8176 for 1957. Had he been able to average this two-year income, his tax would have been $5736 each year, and he would have saved $384.

Had this firm been a corporation, the tax would have been $5400 in 1956 and $10,100 in 1957. If the corporation had been able to average its income, the tax would have been $7200 each year — a tax savings of $1100.

Average Your Income

Hence it is to your advantage, tax wise, to average your income as far as possible. Your firm probably reports its taxable income on the basis of cash receipts and disbursements. Under this method of accounting, income is reportable when actually or constructively received; expenses are deductible when paid in cash or its equivalent. Firms using the accrual method, on the other hand, report income when earned and deduct expenses when incurred. The cash method adapts more readily to shifting of income and expenses from one year to another.

Firms whose 1957 income, to date, appears to be low in comparison with their anticipated 1958 income are in the position of the consulting engineer firm in our example. If this is the situation, every effort should be made to increase 1957 profits, thus tending to average the firm's income for 1957 and 1958. This can be accomplished by accelerating receipts and deferring deductions.

Acceleration and Deferment

To accelerate receipts, you should intensify collection procedures on billings already rendered and prepare any billable but unbilled invoices as soon as possible. Your goal, on the cash basis, is to speed up the receipt of funds before January 1st. If you are operating on the accrual basis you will establish the fact that you have earned the right to the income during 1957.

The deferment of deductions on the cash basis is easy. Merely postpone paying as many expenses as possible until after January 1st. (Accrual basis firms must delay incurring the obligation, and that is harder to do.) When planning these deferments, determine a specific amount in dollars that you are aiming for; then cease or reverse your procedure when that amount has been reached or exceeded.

Firms whose 1957 income to date appears to be higher than that anticipated for 1958 will want to

reverse the described procedure and defer receipts while accelerating deductions.

To defer receipts, cash basis firms will relax any collection efforts and delay billings so that clients will not receive invoices until after December 31st. Remember that simply failing to deposit a check received in 1957 until 1958 does not shift income to 1958. Accrual basis firms are limited to situations where their right to the income may be postponed.

Acceleration of deductions is relatively easy under either accounting method. You might make needed repairs on your office or purchase noninventoried supplies. Bonuses also should be considered; however, those of you who operate as sole proprietors or partnerships may deduct only amounts actually paid to your employees. Accrual basis firms may accrue the bonus liability in 1957 and pay employees in 1958. Under this system the firm deducts the expense in 1957, but the employee reports in 1958. However, employee-stockholders in a corporation should be paid by March 15, 1958 to make the corporate deduction allowable.

There are two limitations to the acceleration of deductions. Prepayment of rent will not shift the deduction. Business taxes cannot be shifted unless you are on the cash basis and local law permits acceleration or delay.

Keep Tax Bracket Same

This discussion assumes that income tax rates are identical for both of the years involved. We could only make guesses as to whether there will be a tax reduction next year, but if you want to guess that tax rate changes are in the offing, your efforts to adjust your income between 1957 and 1958 should be directed toward ending up in the same tax bracket rather than toward having an identical income for both years.

Partnerships should treat their problem just as if they were sole proprietorships. Fiscal year firms should consider all references to December as applicable to the last month of their own company year.

There are other tax saving potentials for the consulting engineer besides those having to do with his business income. Salaried employees also should apply these principles to their own returns.

Each taxpayer is given an annual option permitting him either to itemize personal deductions or to take the standard deduction. The standard deduction is limited to 10 percent of adjusted gross income or $1000, whichever is less. Married couples filing separately are limited to $500 each. By proper timing of your personal deductions, you may advantageously alternate between standard deduction one year and itemized deductions the next.

Here is the way that works. John Jones is married, has no children, and keeps his personal accounts on the cash basis. He had an adjusted gross income of $12,000 in 1956 and expects the same amount in 1957. Assume that in each year he had $900 worth of personal deductions, of which $750 could be either accelerated or deferred. If Jones takes things as they come, he will claim the standard deduction each year and will pay a total tax of $4296. Instead, if Jones accelerated $750 of his personal deductions into 1956 and itemized his deductions; then took the standard deduction in 1957, his total tax becomes $4127. He has managed a tax savings of $169.

Contributions

In determining what deductions can be accelerated or deferred, remember that contributions are deductible in the year paid. Hence to accelerate or defer, merely pay or hold over. Your limitation is that allowable contributions cannot exceed 30 percent of adjusted gross income. The 30 percent applies if at least 10 percent is to churches, schools, or hospitals.

Contributions in kind rather than cash should be considered. A gift of personal property such as stocks, works of art, or real estate may be deducted at their present value. To illustrate this, Mr. Brown has stock which cost him $2000. Its current value is $2800. He gives this stock to a new hospital building drive. His charitable deduction is $2800, and he is not taxed on the $800 increase in value. Had he sold the stock and given the proceeds to the hospital, his deduction would have been the same, but he would have been taxed on the gain.

It is possible, if your tax bracket is high enough, for you to make a gift in kind, and realize a greater savings in taxes than you would net if you sold the item. In brief, gifts in kind on property that has increased in value stand to help you toward tax savings. Sell first, then make the gift if the item has depreciated in value, or you stand to lose this tax advantage.

Prepaid Interest

Interest is another item to consider. It often can be prepaid and thereby accelerate deductions, but postponement would seldom be advisable.

Property taxes, local law permitting, may be accelerated or deferred. In some states, tax bills are mailed out in or before December and may be paid in or after January. Hence, two years tax payments can be telescoped into one calendar year.

Automobile license plates can be handled in the same way.

State income taxes vary. If your state permits payments only with your final return you really have no choice. If you are permitted to pay either with the annual return or through quarterly declarations, you can regulate this deduction. Pay one year with the return and quarterly for the next.

Medical expense deductions present other problems. Only the excess of medicine and drug expense



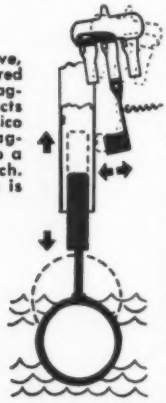
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over 1 percent of adjusted gross income may be considered with your other medical expense. This aggregate amount is further limited, unless you are 65 years of age or older, to the excess of 3 percent of your adjusted gross income. There is also a limit of $2500 per exemption with a maximum of $5000 on a separate return and $10,000 on a joint or head of household return. Hence, what you do with your medical expense may have no bearing, for the amount might not qualify as a deduction anyway.

The year of payment is the year of deduction, but medical expenses may not be prepaid. Your best bet here appears to be to pay currently all your medical expense, if the total is large enough to qualify as a deduction. Defer what you can, if the amount is not large enough to qualify.

It may be to your advantage for you to borrow money to permit maximum acceleration of deductions. Your minimum tax rate savings is 20 percent — substantially greater than the interest you would pay on the loan.

Capital Gains

Capital gains (and losses) is another field that warrants consideration. The sale or exchange of capital assets produces capital gains or losses. Capital assets include all property except inventory, depreciable business property, business real estate, certain copyrights and compositions, certain notes and accounts receivable, and certain short-term government bonds.

If the assets have been held for 6 months or less, the gain or loss is short term. If the assets have been held over 6 months, the gain or loss is long term. Depreciable business property and business real estate held over 6 months comes under a special rule. All gains and losses from transactions of this nature are netted together. If the aggregate is a gain, it is treated as a long-term capital gain. If the aggregate is a loss, it is an ordinary loss.

All capital gains and losses are applied against each other, dollar for dollar; but for individuals the results are treated differently by the government from those for corporations.

For individuals, net short-term capital gain is taxed at ordinary income tax rates. Net long-term capital gain is taxed at either the ordinary income tax rate or at 50 percent of one-half of the gain, whichever produces the lesser tax. A net loss, whether short or long term, offsets up to $1000 of current ordinary income. Any unabsorbed loss may be carried forward for the next five years as a short-term loss. In each of these years, it is applied against capital gains plus a maximum of $1000 per year. Any portion unused after five years is lost.

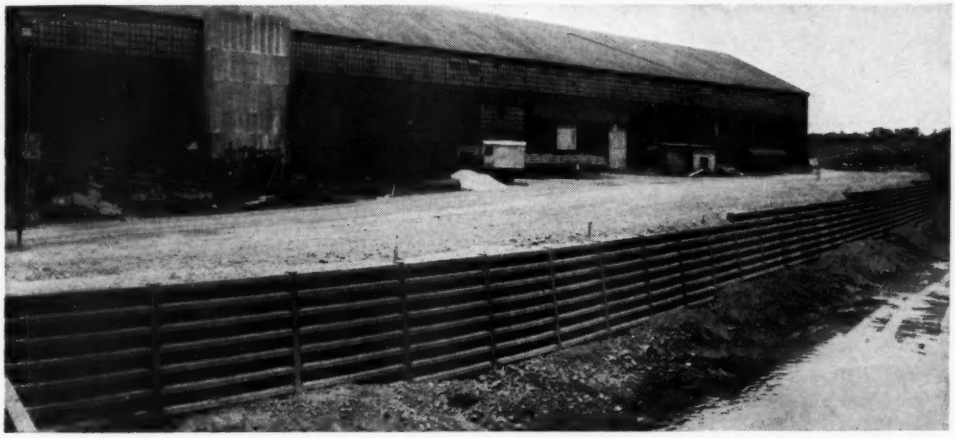
For corporations, while a net short-term capital gain is taxed at ordinary rates, a net long-term capital gain is taxed at a straight 25 percent. The limitation of a net capital loss is zero. No portion of a

Plant Gains 5/8-Acre with an Armco Retaining Wall



READY

This is the bank of the creek bordering the property of Industrial Forge & Steel, Inc., ready for assembly of an Armco Retaining Wall that will gain land for an expansion program.



DONE

Job is complete, and the plant has gained more than half an acre from a formerly unusable stream slope. Also, the site is more attractive.

Industrial Forge & Steel, Inc., Canton, Ohio, needed more space for a plant expansion program. One way this could be done without the outright purchase of additional land was to reclaim the slopes of a creek bordering the property. But was this possible?

The Consulting Engineer recommended an Armco Bin-Type Retaining Wall to handle the job. With this prefabricated metal wall, installation could be made at the edge of the stream. And since the wall would rise almost vertically, the plant could make full use of the area.

The Armco Wall specified was 380 feet long, with heights ranging from 13⅓ to 21⅓ feet. The bank of the stream was cleared of brush, and excavation was made for assembly of the Armco Wall in position. Sections of the wall were bolted together, and the bins were filled with earth. To solve subdrainage problems, perforated pipe was installed behind the wall, with outlets emptying into the creek.

* * *

Armco Bin-Type Retaining Wall is one of more than 30 Armco products used in engineering and construction for industrial, municipal, highway and railway applications.

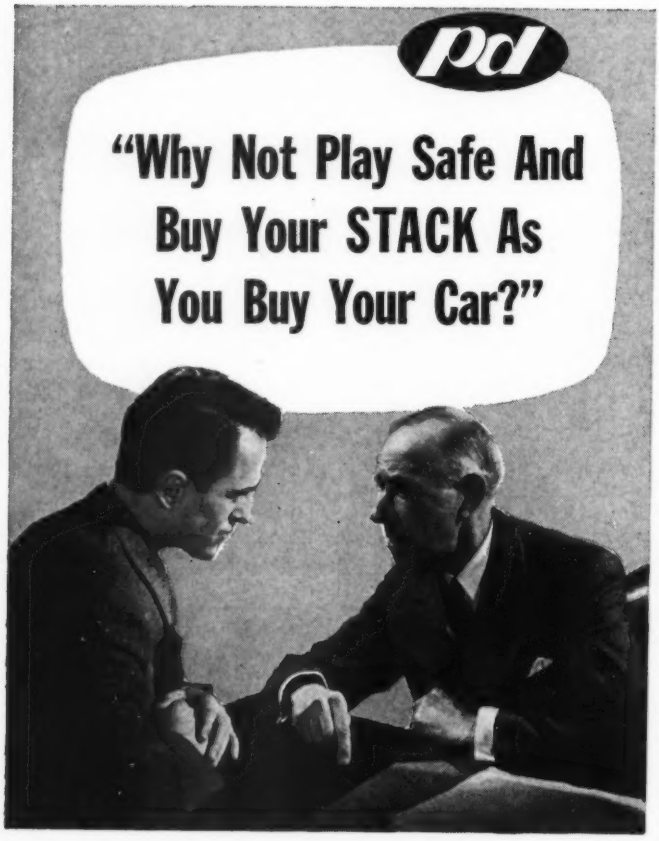


BEFORE Same location, before work began. The plant of the Industrial Forge & Steel, Inc., can be seen only dimly through the brush at the edge of the stream.

Consulting Engineer: Carl F. Schoenbaum, Canton, Ohio

Write us for specific data. Armco Drainage & Metal Products, Inc., 5807 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Armco Construction Products



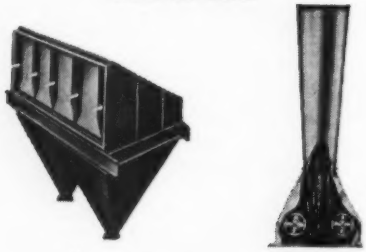
"Joe, you wouldn't buy the engine of your car from one manufacturer, the wheels from another and the body from still another, would you? Neither would I. And when I design for induced draft, I specify a P-D Stack because the I.D. Fan, though it is important, isn't the whole story. The combined breeching, stack and fan, built as ONE apparatus, gives me unit responsibility, compact design, simplified engineering, and positive performance, with a lot less purchasing details.

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"There's nothing like putting all the responsibility on ONE manufacturer's shoulders if you can, for then you'll come out on the long end nine times out of ten. Buying such equipment piece-meal is antiquated and costly."

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loss may be applied against other current income, but there is the five-year carryover against subsequent capital gains.

Matching Gains and Losses

It is the proper matching and timing of capital gains and losses that must be considered. Here are three examples:

¶ You already have long-term gains of $5000 and may, before the year's end, take a short-term loss of $3000 and a long-term loss of $6000. You expect to realize a short-term gain of $8000 in 1958. What should you do?

Defer the losses until 1958. You already have the most favorable tax position for 1957, since only one-half the gain will be taxed at either your regular rate or 50 percent, whichever is lesser. The losses postponed until 1958 will offset the full taxable gain of $8000 and leave the $1000 to be deducted from other 1958 income.

Taking the $6000 long-term loss in 1957 will offset the already realized gain, plus a $1000 deduction from other income; but you will be taxed on $5000 at ordinary rates in 1958.

¶ You already have long-term losses of $4000 and may, before the year's end, take a short-term gain of $3000 and a long-term gain of $3000. What should you do?

Take the short-term gain in 1957 and the long-term gain in 1958. You will offset current losses and gain the $1000 deduction against other income. The 1958 gain will be taxed at the favorable capital gains tax rate.

¶ You have a short-term gain of $1000 and may, before the year's end, take either a short-term loss of $2000 or a long-term loss of $3000. In 1958, you expect a short-term gain of $3000 and a long-term gain of $4000. What should you do?

You should take the long-term loss in 1957 and the short-term loss in 1958. The long-term loss in 1957 will provide a deduction of $1000 from ordinary income and leave a $1000 carryover as a short-term loss. This $1000 carryover added to the $2000 short-term loss will eliminate the fully taxable short-term capital gain, leaving the long-term capital gain to be taxed at the favorable capital gains tax rate.

If you took the short-term loss in 1957, and the long-term loss in 1958, the results in 1957 (except for the carryover) would be the same. In 1958, however, the long-term loss would reduce the long-term gain to $1000, while the short-term gain would be fully taxed.

It now should be obvious that just setting back and letting your income level and your deductions fall where they may can cost you more in tax dollars than you need legally pay. Give these matters thought in the weeks remaining in 1957. It should mean money in the bank for you. ▲▲

DEMANDS BALLAST PROGRESS

higher working foot-candles. This means more lamps per fixture and higher lamp currents. To reduce possible glare caused by higher light output, fixtures now utilize louvers or lenses, which contribute to the retention of heat. And, because space is limited, smaller cross-section ballasts are used. Thus, modern fixtures ***generate more lamp and ballast heat, yet are less able to dissipate it.***

Because ballast life may be shortened if ballast temperatures are excessive, modern lighting design and application techniques place huge demands upon the ballast industry. If fluorescent lighting progress is to continue, better ballasts which will operate below standard industry heat specifications in modern applications must be developed. ***Thus, lighting progress demands ballast progress.***



In working toward ballast progress, General Electric engineers have recognized that high ballast operating temperature is perhaps the largest problem to be overcome. The most important single step in solving this problem has been the development of a realistic new approach and new facilities for accurately measuring ballast operating temperatures. In a specially-constructed, temperature controlled laboratory, ballasts are actually installed in modern, totally enclosed fixtures, without the aid of heat dissipating devices (except for normal ballast base contact with the fixture channel). These fixtures are flush-mounted or recessed against typical acoustical ceilings. Thermal measurements are taken only after the ballast has reached a stable operating temperature. ***Thus General Electric ballast heat measurements reflect actual, modern operating conditions.***

As a result of such research, General Electric's entire ballast line is continually undergoing major improvements designed to provide superior performance. The most recent example of G.E.'s research and development is the redesign of its 89G545 line of 40-watt, rapid-start ballasts to operate efficiently well below the industry standard of 90°C. in modern applications. Such ballast progress allows maximum latitude in fixture design and styling.

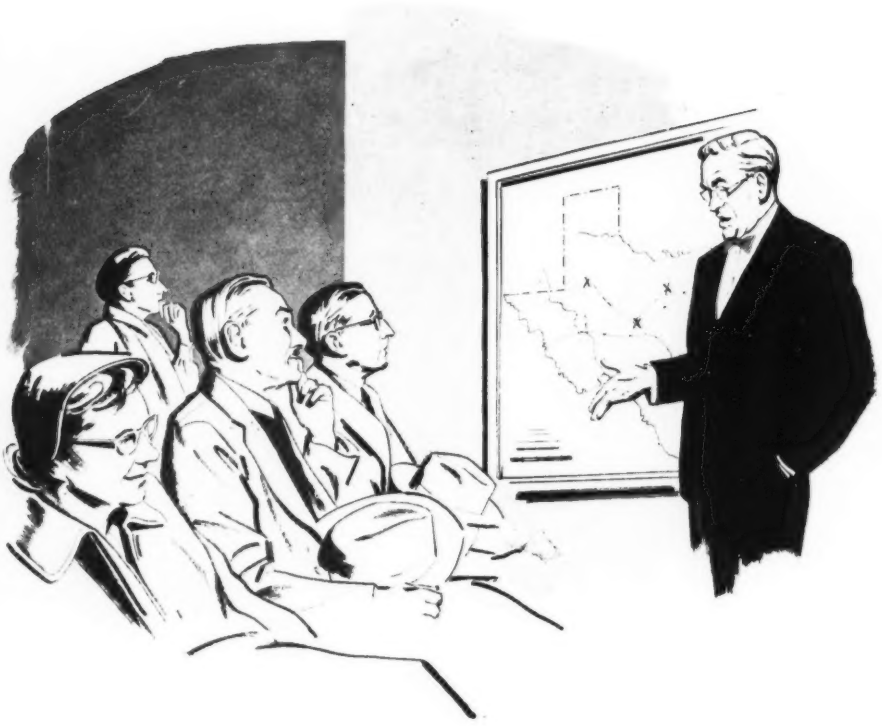
Specify General Electric ballasts! They are engineered to back up your efforts toward modern, functional lighting—*and lighting progress.* As we see it, General Electric ballast progress *is* answering the needs of lighting progress. General Electric Co., Section 401-52, Schenectady, N. Y.



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LAWRENCE S. WATERBURY
Consulting Engineer

Lawrence S. Waterbury, well known for his highway and transportation engineering, recently retired as a partner of Parsons, Brinckerhoff, Hall & Macdonald. He now has his own office as an independent consulting engineer in New York City. He continues to serve Parsons, Brinckerhoff as a consultant. In recent years most of his work has been concerned with valuations, appraisals, and technical-economic reports. One of his most recent studies was the $415 million northern Illinois Toll Highway, in collaboration with Wilbur Smith and Associates. He is a member of the American Society of Civil Engineers, the National Society of Professional Engineers, and the Highway Research Board.

Your Role in the Public Hearing

THE PUBLIC HEARING is one of the major problems confronting the consulting engineer and his public official clients these days. The right to a public hearing has been written into the Interstate Highway Act and must be considered a major aspect of any road building project involving federal funds. Since public hearings have become more and more an accepted part of any road project, it is essential that the consulting engineer understand their purpose and his role.

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Hearings are Required

The national highway program statute requires any state highway department that submits plans for federally aided highways involving the bypassing of or going through any city, town, or village, either incorporated or unincorporated, to certify to the Commissioner of Public Roads that it has had public hearings or has afforded the opportunity for hearings and has considered the economic effects of its plans. If hearings have been held, a copy of the hearing transcript must be submitted to the Commissioner.

For many, the public hearing is complex and frightening. Competent engineers and public officials cringe at the thought and find themselves in all kinds of difficulties in the hearing room. This need not be. The solution is a proper approach and thorough preparation.

Any technique that tries to circumvent or is devious in any way is doomed. The resulting suspicion and loss of confidence may cause the failure of the whole project and reflect discredit on the consulting engineer and his clients.

Any notion that the details of the project are none of the public's business should be put aside. Using highly technical terminology and involved language is more likely to antagonize than impress the layman. It will prompt sharp questioning and meticulous probing into every detail.

The consulting engineer, we must assume, makes his recommendation after a series of studies and surveys of the situation, which include all potential solutions and various possible route locations. Since he has arrived at a logical and practical answer, he has no reason to make people feel something is being withheld or covered up.

Consider the Audience

The presentation must be made with the type of audience in mind. The consulting engineer should use terms and phrases that are likely to be most easily understood and appreciated by the people whom he expects to attend the public hearing. For instance, if the project is in a rural area, he should use appropriate terms and concepts that will appeal to farmers and their families. Or, if the consulting engineer expects most of the people to be real-estate operators or home owners, he should speak

to them as persons interested in urban values and urban problems. He should never, however, "talk down." They may be as intelligent as he is. They simply are not as informed on the subject for they have not studied it as he has nor do they have his specialized background.

The presentation should not be merely a word report. It should be illustrated with large scale maps of the area involved plus other visual aids to help in understanding the report. The map itself should be simple and clear. Very often consulting engineers do a good job of simplifying the wording of their presentation only to forget to use easily understandable maps and diagrams. Every detail of the presentation must be checked to avoid the possibility of anyone thinking there is any concealment, deliberate or unintentional.

The entire approach must be one designed to obtain understanding, sympathy, and respect. The public must be made to feel that it is being dealt with honestly, that all facts are being stated, and that a real effort has been made to explain things truthfully and in a way anyone can understand.

It should be pointed out, however, that sometimes even an effective presentation of the facts may not suffice when political considerations, pressure groups, or strong personalities are involved.

In such situations the consulting engineer must stand firmly behind his conclusions. Only by refusing to waver can he hope to convince those present of the truth behind his presentation. And despite difficulties with pressure groups, the consultant should not be deterred from making the best possible presentation. Fortunately, if the story is told properly, acceptance or rejection of the project will be determined on the basis of whether or not it will be of service to the majority of citizens, not by the special interest of a small minority.

Meeting the Opposition

I recall two occasions, out of many, when public hearings in which I took part resulted in an organized opposition accepting expressway plans which they formerly had fought vigorously.

In Milwaukee, many pockets of objectors to a proposed road plan were scattered around the area. My firm was retained by the county to work with city and state officials to plan a major expressway system. Many industries and merchants were afraid we would condemn too much property, or that the expressway would leave them isolated. Several of these groups hired their own consultants, who came to the hearings armed with alternate plans which they felt were more favorable to their clients.

We studied each of these alternate plans carefully, and as a result made a few minor revisions in our presentation. Then, at a public hearing, we reviewed each plan that had been presented by the opposition, pointing out the disadvantages and the good points of each. Without this open presentation at public hearings, the expressway plan best for the majority never would have been accepted.

Later, my firm was called in as arbitrator for the location and development of a central artery through Boston. The state and city each had plans, but the two could not agree.

We studied all presentations, then took the best and presented our findings at a public hearing.

First we listened to everyone who had anything to say. Most of those attending were members of the various public bodies, plus a number of merchants and industries affected by the expressway.

After everyone had voiced his opinions, we explained what we had found to be the best solution. Our plan included a tunnel through the most congested part of Boston, whereas former proposals had called for an elevated section for this area. We had many graphs, charts, and maps showing the advantages of our recommended routing.

As a result of these hearings, the state and city agreed on a plan which was a compromise between our proposals and several alternates. The selected plan retained our tunnel recommendation.

The Importance of Preparation

Careful preparation for the public hearing is essential. Frequently difficulties are encountered when a hastily-prepared presentation is made. A deep and thorough analysis must be undertaken and no fact or line of research should be abandoned merely because it does not appear to be directly applicable to the project. If it is a matter at all likely to come up at the public hearing, it should be investigated thoroughly beforehand. Of course, it is impossible to have all the answers, but the more astute you are in guessing at what may come up, the better things are likely to go.

In this connection, it is important to become familiar with the opposition. It even may pay to court certain individuals and groups beforehand so as to lessen their antagonism. An understanding and sympathetic approach to a group adversely affected by the location of a highway even might include a study to determine a possible solution for that group's particular problem. This, however, should be done through the local officials or whomever the consulting engineer's clients happen to be. It should be handled carefully so that there is no question of special treatment, and no one can accuse either the engineer or the public officials of trying to make a deal.

Partisanship and emotionalism should be avoided. A desirable project usually is a one-sided affair. Many more people are benefited than are hurt, but the right of the minority to be heard should not be challenged nor should its position be derided. At the same time, proponents of the project should not be allowed to sleep. People who are against

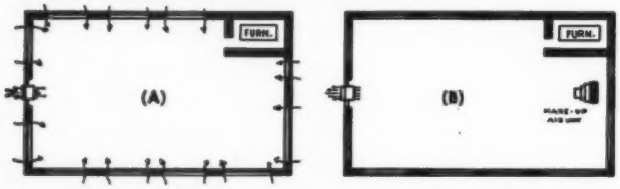


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an undertaking often are better organized than those who are being served. The consultant should not be expected to go into a public hearing as the sole supporter of a popular project. He should make sure that benefited parties are represented and properly briefed.

Here again the consulting engineer must impress his client with the importance of action. He can suggest that a plan be followed for writing to various groups, scheduling meetings with them, and following up with telephone calls to remind them of the impending public hearing date and the importance of their being present.

Proper presentation of economic facts is basic. Studies should include alternate routes, property values, cost of acquisition and right of way, and the economic effect on taxable property. All improvements, however, both sociological and physical, should be spelled out in detail.

Several rehearsals of the presentation should be held in advance so that all will proceed in orderly fashion. A sufficiently detailed and printed statement should be circulated among the group, and statistical documents and other background data should be available for ready reference. Sufficient personnel should be on hand to render prompt assistance. When there are long delays in answering questions or supplying basic information, it generally reflects unfavorably on the presentation. If the consultant or public official is uneasy when speaking before large groups, he should assign the oral work to an experienced associate. Unfortunately, many skilled and highly talented engineers have run into trouble at public hearings because of inability to make an effective verbal presentation.

Have Your Source Handy

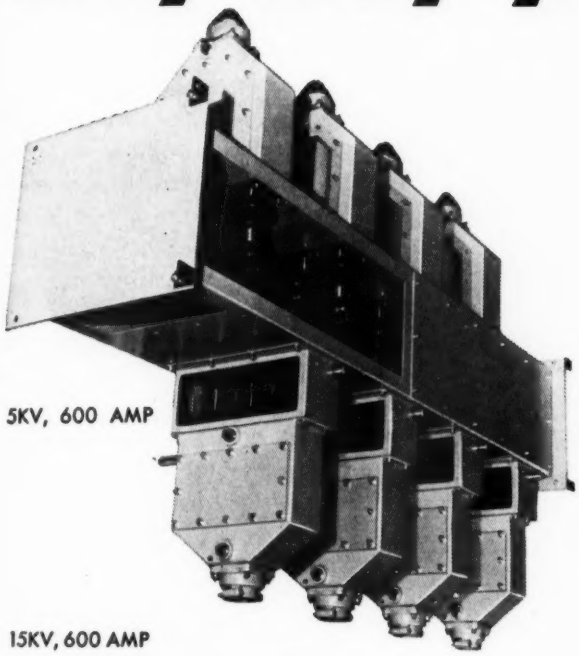
Where specialists have been used to ascertain certain facts or develop particular information, they should be on hand to explain their findings. Frequently public officials and consulting engineers are embarrassed at public hearings when information they had secured from some other source is challenged, and the author of that material is not present to answer the charges.

Proponents of a project must make sure that all parties affected are informed as far in advance as possible of the public hearing. This can help forestall delays sought by opponents who claim they were not contacted or given sufficient time to present their evidence. This is not only practical but honest, and the consulting engineer must remember that despite his duty to his client, he is looked upon as the independent appraiser of the project, and he must make his recommendations on the objective basis. If he disagrees with his client's position, he should not take the job.

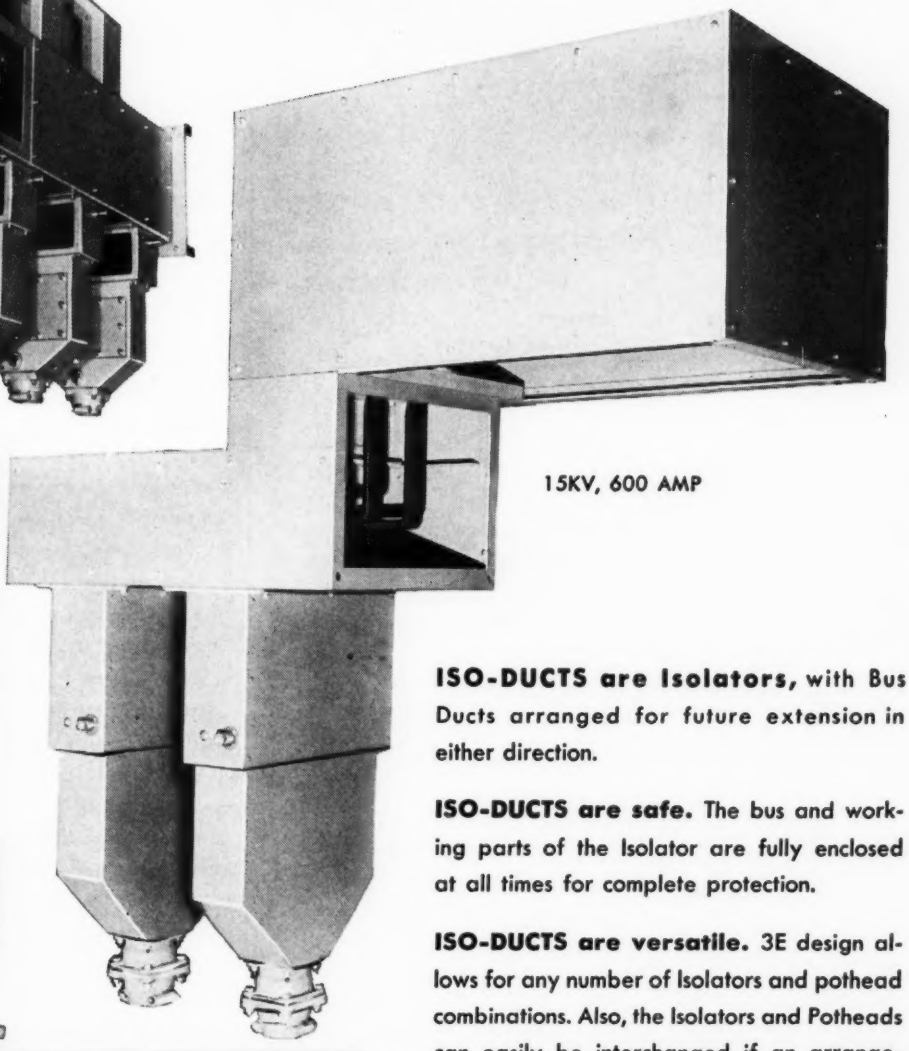
If an opposition group brings reports that are of a sufficiently detailed nature so that they cannot

Any way you look at it!

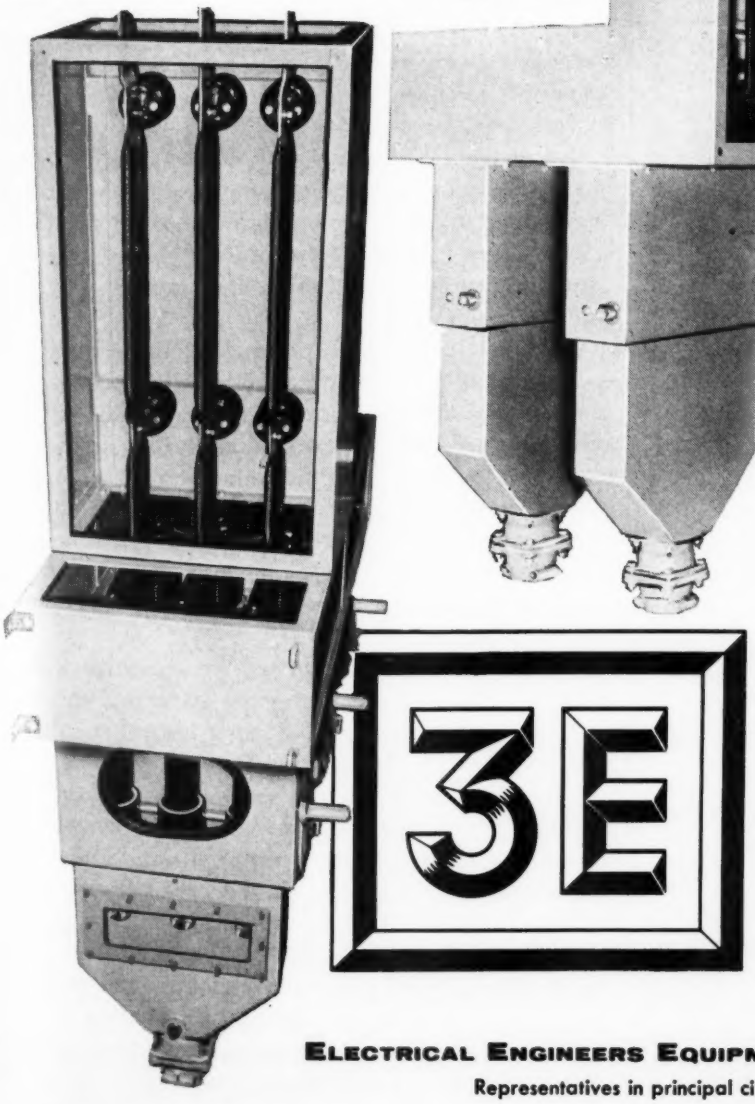
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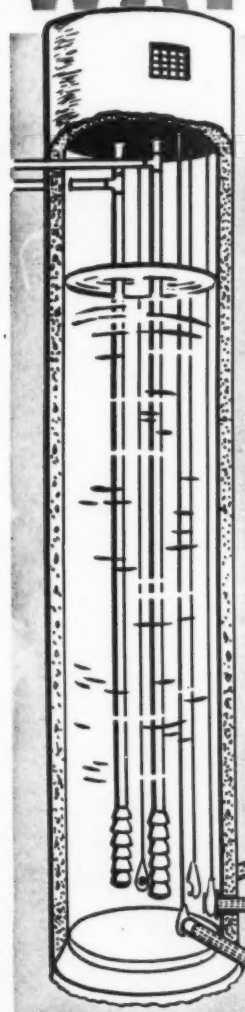
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be immediately and properly commented upon, you should request a delay so that you will have an opportunity to study the new information. It is wrong to attempt to make a hurried analysis of a contradictory report. The request for the delay will not reflect unfavorably upon your presentation.

Similarly, if a question is offered that you cannot answer, you should request additional time to make a proper study before offering a reply. It is embarrassing and could be damaging to a presentation if a question cannot be answered immediately. But there certainly will be occasions when some new matter is introduced which the consultant should not be expected to comment on, without study.

If the consulting engineer explains, with proper sincerity, that this is a subject that is new to the question at hand, and to which he wishes to give proper study, there should be no unfavorable reaction. A lot depends, however, on the conviction with which he makes his request for delay.

Handling the Press

Prepared press statements are extremely helpful, as they give the representatives of the various media interested in the matter a specific report which they can study and question. Where no press statement is given, the press coverage will depend upon the experience and ability of the reporters present, and some might not be sufficiently familiar with the problems to make an accurate and fair report. A proper and complete press statement, accompanied by simple maps and other illustrations, will be very helpful to the press and will help the consulting engineer and his client get friendly and fair treatment.

The consultant should not make independent pronouncements to the newspapers. His progress reports should first be cleared with the public officials concerned. While it often is advisable to release some preliminary findings, the major highlights should be released at the public hearing or in time for press deadlines. Otherwise your position will have appeared in print in advance and stories on the hearings may be devoted largely to the opposition statements.

In dealing with the press, be as impartial as possible. Even if one paper is attacking the project, the representative of that paper should be treated like all the others. Playing favorites will inspire greater opposition and create distrust.

Most public hearings can be handled smoothly if there has been sufficient preparation. Sometimes, however, these hearings have become very complex, as in a dispute between the state and city governments or between two local communities. But the basic principles of approach and advance planning still apply. In a sense, the public hearing is like election day, and success depends in large degree upon the skill shown during the campaign. ▲▲

Report from Austria

RUDOLPH SOBOTKA
CONSULTING ENGINEER CORRESPONDENT



HERE IN AUSTRIA, the long-awaited federal law having to do with state-authorized and sworn-in architects, consulting engineers, and civil engineers (Civil Technician Law), aroused a storm of protest among many of the persons concerned.

Unified Act

The law originally was drawn up with the intention of unifying in one single act the many scattered laws regulating architects and consulting engineers. At the same time, it was to give legal protection to the professional designations of "civil technician," "architect," "consulting engineer," and "civil engineer" against misuse by unauthorized persons. Heretofore, legal action against misuse of these titles could be taken only if their use constituted unfair competition.

The new law was passed by both houses in the middle of this year. Now, some of the civil technicians are beginning to suspect that the legal protection of their titles was bought dearly. Most vexed were the architects, who pointed out that the tenor of the law was tantamount to a *Kolkhozisation* of their profession.

Increased State Powers

It lies in the nature of a state apparatus to let no chance go by to increase its might. The legislature seemed to feel that since the new law protects the titles of civil technicians, then the state has the right to have the applicants for these titles pass an examination and meet many other legally established qualifications.

It is not so much the taking of one more examination that caused the indignation among the architects, but rather the fact that from now on graduates from the Academy or School of Technology have to spend five years of practical training in the office of a state-authorized architect before they are allowed to face the board of examination of the Ministry of Trade and Reconstruction, which then may bestow upon them the title of "state-authorized and sworn-in architect."

All Must Be State-Authorized

In former times, graduates with a diploma from an Academy or School of Technology in their hands could open their own architect's office, and about two-thirds of the graduates who could afford it, did so. They were not forced to become members of the Chamber of Engineers. The other third, looking for greater prestige, usually practiced for five years in the office of a state-authorized architect in order to become themselves "state-authorized and sworn-in architects," and automatically become members of the Chamber of Engineers. Now, all must participate in this internship.

The new law also gives the Chamber of Engineers, of which there are four in Austria, much more power, for now every civil technician, including the



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architects, must become members of the Chamber of Engineers.

The examination required under the new law covers:

¶ Systems of political economy,

¶ Austrian administrative law,

¶ Legal and technical regulations that are valid for a special branch of profession,

¶ Regulations concerning professional matters.

The examination may be repeated only one time. Only special circumstances allow for a third chance.

About 400 architects who are not "state-authorized" thus will have to practice for five years under a state-authorized architect and then take the examination. The only alternative is to close down their offices right away. There is no grandfather clause in the law, and infringements are punishable by a maximum sentence of 30,000 schillings ($1200) or six weeks imprisonment.

The serious nature of the present situation became apparent when it was realized that under the new law the president of the Academy of Applied Arts in Vienna, the designer of the Austrian pavilion at the World Exhibition in Brussels, and numerous other architects of world-wide reputation will be denied the right to practice from their own offices.

It also is feared that the state, under the pretext of having to protect the titles of civil technicians by means of an examination, may find means for regulating and controlling the size and perhaps even the political leanings of the technical profession.

Advocates of the new law pointed out during the parliamentary debate that by making the examination obligatory, the domestic economy will be spared many losses which allegedly have been caused by unqualified persons who passed themselves off as civil technicians.

But there is some irony in the fact that the law does have a grandfather clause permitting master carpenters and master



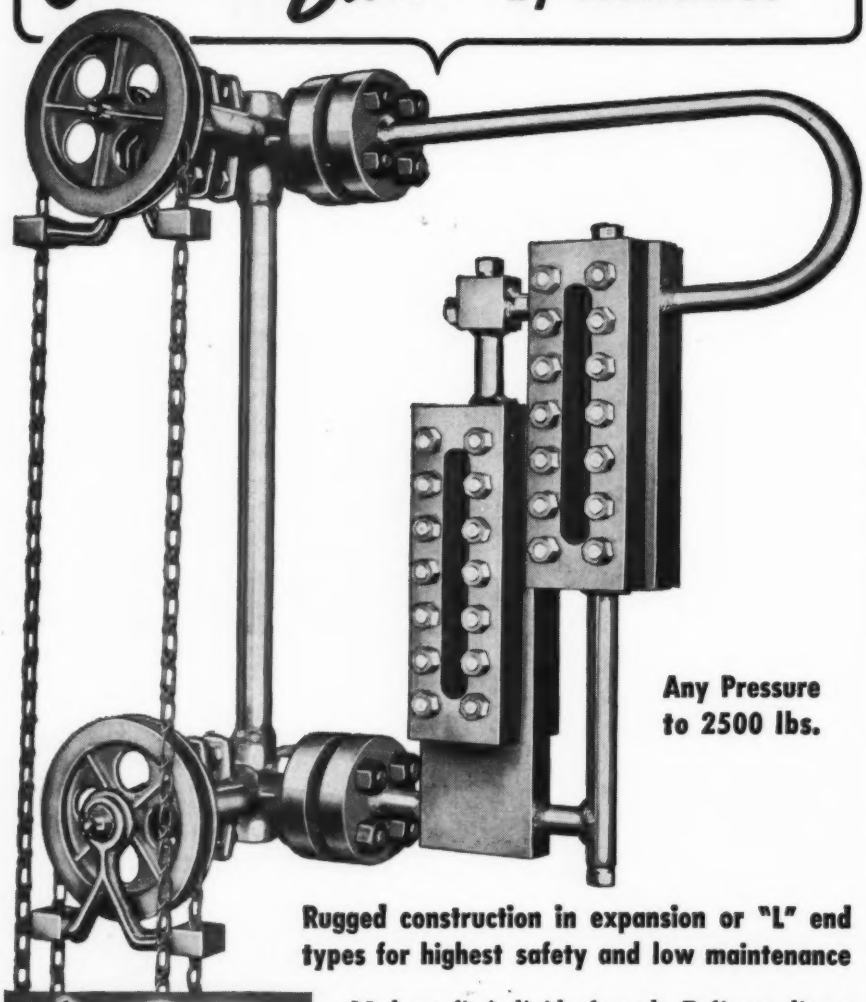
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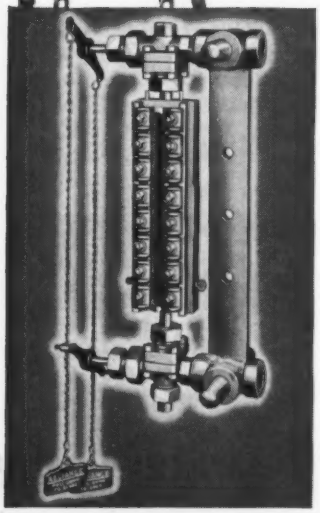
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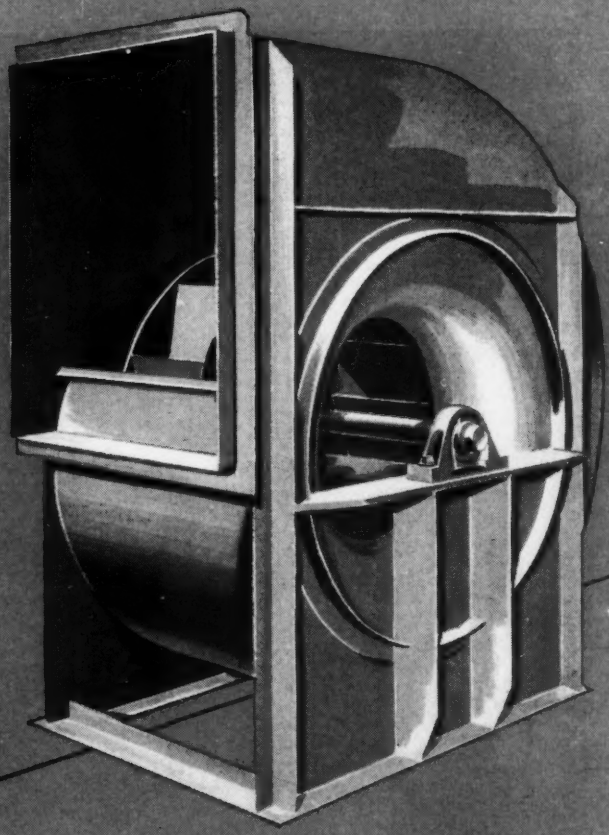
bricklayers to continue calling themselves "architects" provided they can prove that they did before 1952. Almost as bad, in order to spare the state an awkward situation, architects that have been in the public service for at least 10 years may keep on using their title and even are exempted from the examination. And a provincial governor, a layman, is entitled by the law to rescind the state-authorization of a civil technician, if the governor notices in his work any "deficiencies" resulting from lack of professional knowledge.

Furthermore, architects and consulting engineers are bound by law to perform for the federal or provincial government, in return for a fee, any services which fall into their field. They cannot refuse the work whether they want it or not.

The number of fields for which consulting engineers may qualify was increased by two — fermentation technique and agriculture. The other fields are structural design; machine design; marine engineering; electrical engineering; chemical engineering; physical engineering; combustion, heating, and air-conditioning; surveying; mining; metallurgy; mine surveying; forestry; and *Kulturtechnik* (drainage, sewers, bridges and roads, and water distribution).

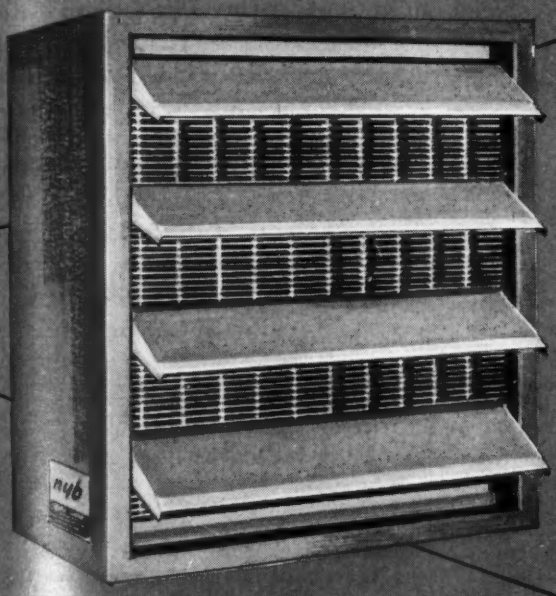
Most engineers and architects feel that spectacular professional careers are things of the past in Austria. Every step of practice of the civil technicians is well-defined and controlled by the law. For example, after completing his study at a University, School of Technology, Academy of Arts, or School of Agriculture, the graduate engineer is apprenticed to a state-authorized civil technician for a period of at least 5 years. During this time, applicants for the title "Consulting Engineer for Structural Design," for instance, must spend at least 2 years on building sites; those for "Electrical Engineering" must acquire practical knowledge in the field

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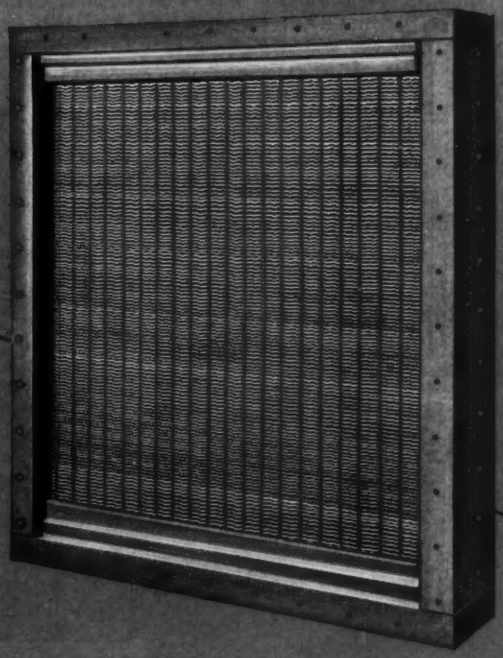
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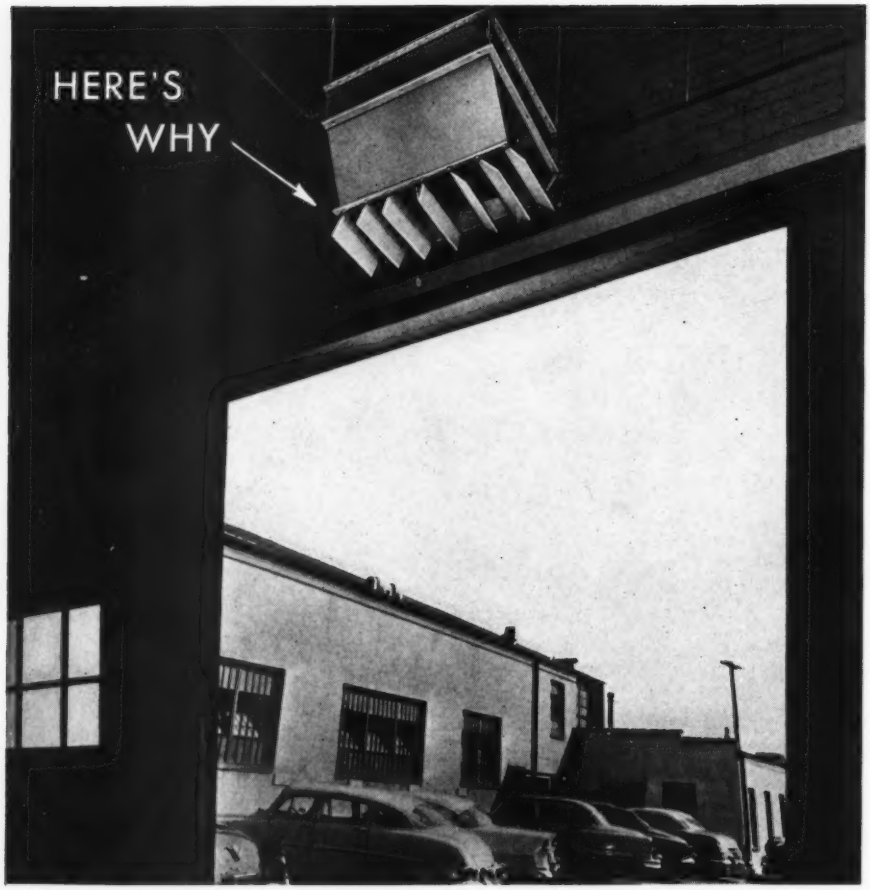


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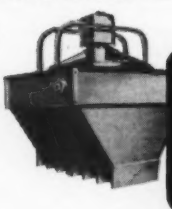
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Under certain conditions, the applicant may sit for the examination during his third year of practical training. The examination is oral and public; a majority vote of the examiners decides between "qualified" and "unqualified."

The authorization for the opening of an office is granted by the Ministry of Trade and Reconstruction after consultation with the Chamber of Engineers and the provincial governor. The consulting engineer must then, within six months, take an oath. The oath reads, "I swear by God, the Almighty, a solemn oath that I will be loyal to the Republic of Austria, will observe inviolably all laws and regulations which bear upon my activity, will observe meticulously the duties of my profession, will perform my services to the best of my knowledge, and observe closely the imposed obligation to secrecy, so help me God." Persons without a creed may omit the invocation of God. After this the engineer may open his office and hope that some provincial governor will not rescind his hard earned authorization to practice.

The essential contents of the authorization document and the place of the future office must be published in the official gazette at the expense of the consulting engineer. The Chamber of Engineers then has to approve the seal which must feature the coat of arms of the republic, the engineer's name, academic degrees, and place of office. The Chamber also provides him with an identification card.

This is a trying situation. Engineers and architects agree that members of their professions should be qualified and protected by law, but they fear that this is another instance of giving up a pound of independence for an ounce of protection. ▲▲

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New Orleans, La.	St. Martin's School	James M. Todd & Assoc.	Frank A. Dorsa	Bob Barnes
Pullman, Wash.	Women's Residence, W. S. C.	James B. Natkin	Senna Service, Inc.	Stan Schafer
Moscow, Idaho	University of Idaho Library	Whitehouse, Price, DeNeff & Geeble	Detweiler Bros.	Stan Schafer
Minneapolis, Minn.	Zion Lutheran Church	Thorsov & Cerney, Inc.	Dean L. Witcher, Inc.	Art Narverud
St. Louis Park, Minn.	Cathedral High School	Louis C. Pinault	Roel Construction Co.	Art Narverud
LaFayette, Ind.	Purdue University Dorms	Walter Scholer	Freyn Bros.	Don Davisson
Bloomington, Ind.	I. U. Medical Science Building	Ammerman, Davis & Stout	Hayes Bros.	Don Davisson
Fairview Park, Ohio	High School	Fulton, Krinsky & DelaMotte	Gorman-Lavelle P & H	Jerry Sullivan
Gates Mills, Ohio	St. Francis of Assisi Church	Horn & Rinehart, Archs.	Gorman-Lavelle P & H	Jerry Sullivan
Pittsburgh, Pa.	High School	P. B. Fleming, C. Engr. Celli & Flinn	John Kennelly	Wm. Negle


Harold Jope


Dick Disney


Russ Collins


Dick Finklea


Nic Nicodemus


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Report From The East Coast

STAFF

Many conscientious engineers have found the convention season is the best argument for unity. Attending major gatherings all over the nation, they have deserted home and office for an annually increasing series of convention halls.

ASCE Annual Meeting

One of the busiest gatherings, to date, was the annual American Society of Civil Engineers meeting in New York City.

Major topics of discussion were:

Education—At the conclusion of a four-year study, aided by an opinion research organization, Adolph J. Ackerman (consulting engineer, of Madison, Wis.) and his committee presented their findings to the ASCE board and membership. These findings are to be announced in a special issue of *Civil Engineering.*

Everyone agreed on one thing — something needs to be done about improving the education young engineers now are getting.

Ackerman's report states that "engineering progress and the resulting pressure for adding new courses emphasizes the impossibility of uniform adherence to the four-year undergraduate curriculum as now generally offered." The survey found that many ASCE members favor a five-year program.

Standardization of the length of undergraduate study, by itself, is not the answer, Ackerman's report states. Instead, the committee recommended "increased emphasis on postgraduate training, extension of the time devoted to undergraduate training, evening courses for employed engineers, self-education of various types, and clinical lectures and discussion by practicing engineers."

The ASCE board, at a separate meeting, passed a resolution urging year-round schooling in engineering. The board was acting on recommendation of the Conditions of Practice Committee.

Present educational facilities and faculties, in service about nine months of the year, were declared to be an inefficient use of scarce and much-needed tools of education.

The board went even further — and suggested that year-round use of educational facilities, if practiced in public schools, would relieve overtaxed units of the entire educational system.

Loss of Prestige — Ackerman's committee, in the survey, found an alarming indication of the decline of the prestige for the civil engineering profession.

At one time, most deans of engineering schools were from civil engineering departments. Now, a majority of the deans are mechanical engineers.

Although the number of civil engineering students is increasing, the committee found that the increase was not proportionate to that of other departments of engineering. In addition, a large number of civil engineering students are lured into other fields of engineering after graduation by higher salary offers.

Many civil engineers and civil engineering students querried said they feel that the general public does not consider civil engineering as important as other branches of engineering.

The board, recognizing that the more "glamorous branches" of engineering are attracting a disproportionate share of students, appropriated $2500 for preparation and printing of a brochure, directed to college freshmen, explaining the various satisfying aspects of a career in civil engineering.

Economic Welfare — The survey showed some ASCE members feeling that the Society should pay more attention to the economic welfare of its members, while other members felt their economic welfare was outside the jurisdiction of the ASCE.

The Ackerman committee said that while the economic welfare of the Society should receive continuing attention, the primary function of ASCE is professional and ethical development of members.

The Economic Advancement Committee agreed that professional ability and an ethical attitude are fine, but "the committee concluded early in its de-

PUTTING THE BRAKES ON A 632 MPH SLED!



Being strapped in for another record-shattering run is Colonel John Stapp, USAF, who, through piloting of the Northrop sled, has become the "fastest land-based man on earth."

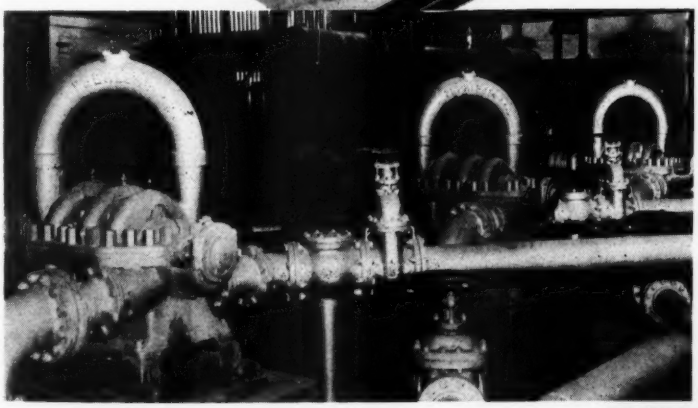
Air Force technicians make final settings on six rockets which propel sled.

PEERLESS PUMPS SUPPLY WATER FOR STOPPING NORTHROP'S ACCELERATION TESTING SLED

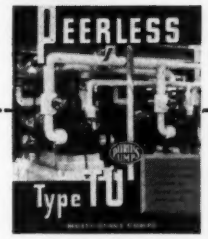
How violent are the reactions of a man to severe, blinding acceleration? Does he black out, maintain equilibrium, lose senses? And what happens under sudden, screeching deceleration? How many G's can he be expected to withstand and still function?

Answers to these and many other questions in the fields of aviation, physics, and environmental physiology are being found with each successive test by Colonel John Stapp, USAF, and his flying sled. Truly a "rocket on rails," this contribution is providing invaluable data for science by duplicating the stresses of flight on man, *on the ground.*

A highly important segment of this sled project, namely that of braking the vehicle, is dependent on the reliability of the pumps that supply the unique water-trap braking system. Performance of this vital task has been delegated to four Peerless Type TUT 3-stage centrifugal pumps. Here is one more instance where good design, sound construction and skillful application add up to a quality Peerless installation. Whatever the use, no matter what the requirements, there is a Peerless pump that will do the job and do it well. *For remember, Peerless stands for performance.*



Shown above are three of the four 4" TUT-14 3-stage Peerless centrifugal pumps that form the water-supplying unit. Running at 1750 RPM, these pumps move 500 GPM to the braking system which is 500 feet away from the pump installation.



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liberations that men whose minds are oppressed by economic burdens do not attain the higher levels of professional achievement."

This committee suggested creating a "surrounding climate favorable to economic growth."

Unity — Everyone liked the idea of unity, but the term, as used, referred to unity through the Engineers Joint Council.

Louis R. Howson, incoming ASCE president, said that "EJC is definitely the organization that has the breadth, the membership, and the background to speak for the profession."

Joseph W. Barker, president of EJC, flatly rejected the current proposal of the American Institute of Electrical Engineers for unity.

"As consulting engineers, what would we say about an engineering project management as poorly effective as our multiplicity of separate engineering societies is? We would pan Hell out of it. Let's apply that same sound engineering analysis to our own problem and come up with some better answer than we now have or the 'tripartite' confederation (AIEE) recently suggested," Barker said.

Instead, he described an American Society of Engineers, to which all qualified engineers could belong. Its senior organization would then speak for the entire profession on such questions as education, legislation, and engineering philosophy.

Under this senior organization, departments could handle specialized needs. And under each department, a series of specialized divisions could work.

Further Surveys — Ackerman said his committee feels that an extensive survey of the civil engineering profession, as his group suggested earlier, is not necessary.

"Remember that surveys are an aid, not a substitute, for good judgment," he added. Instead he suggested that local sections organize permanent committees on professional education.

Consultants' Fees — In a speech before the convention, Bertram D. Tallamy, U. S. Highways Administrator, made an appeal for establishment of new fee curves, to be used by highway agencies at all governmental levels to "help clear the atmosphere" in evaluating services provided by consultants.

The ASCE board directed a subcommittee to make a special study to develop fee curves covering highway engineering services.

Washington Representation — The board approved a plan to engage a Washington law firm to assist the executive secretary and his staff in representing the society. This action was "taken as a result of widespread feeling among members that ASCE should contribute to national affairs in all matters related to civil engineering."

Registration — The board approved a registration policy recommending that registration laws include provisions for corporations to practice engineering, provided a majority of the officers, directors, and engineers in responsible charge of projects are registered.

Politics — Mason G. Lockwood, retiring president of ASCE, was giving an inspired speech in presentation of the first honorary membership to be awarded in absentia. After several minutes of explaining the importance of this award to a prominent German, up to this point unnamed, Lockwood said "and now, the ASCE is proud to present this honorary membership to . . . Karl Marx."

After regaining his power of speech, Lockwood explained that he had meant to say "Dr. Karl Imhoff," the prominent engineer of Essen, Germany.

EJC-ECPD Meeting

It was the best of all possible worlds, as Engineers Joint Council and the Engineers Council for Professional Development joined forces in New York City for their first joint assembly.

Harmony oozed everywhere, as Morris D. Hooven, president of the ECPD, blew out the candles on his organization's 25th birthday cake and made a wish for unity.

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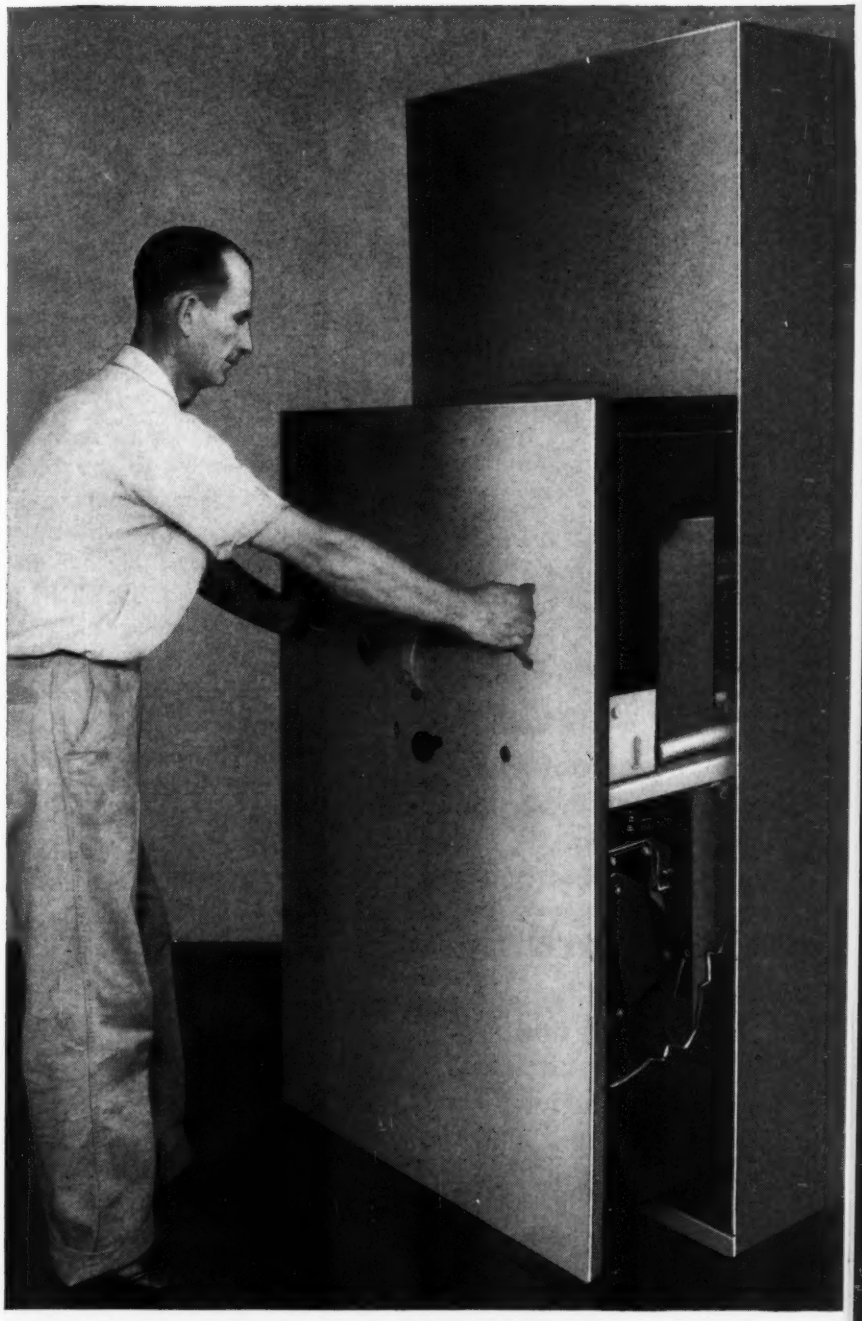
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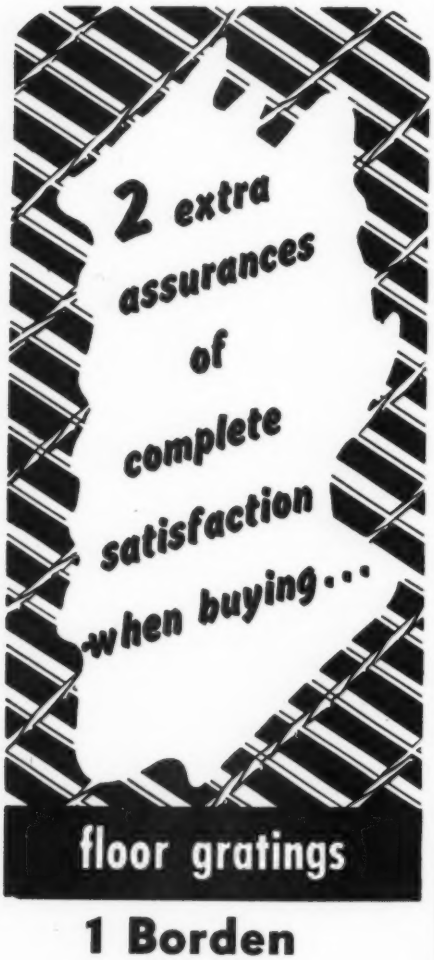
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He pointed to the conference as evidence of solidarity in the engineering profession. "Although we are not a single unit structurally and organizationally, we have a spirit of unity that can't be matched," he added.

Included in the more than 325 persons attending the assembly were the presidents of 18 national societies. The guest list included the president of the National Society of Professional Engineers and members of the Institute of Aeronautical Sciences and the Institute of Radio Engineers. These are the three groups that have applied for ECPD membership.

Hooven explained that the situation remains unchanged in regards to the three organizations being added to the ECPD roster. The charter must be revised to allow for new members.

In preparation for the charter amendment, the ECPD planning committee submitted a report reaffirming its belief that ECPD should stick to its present areas of operation. This area then was clearly defined, with full reports to be circulated to the presidents of all constituent societies.

The field and function of ECPD, as set forth in the report, is "the development of the individual engineer rather than with engineers in groups or with engineering as a whole . . . ECPD guides the high school student into the engineering college; sees to it that the engineering student obtains a sound education in both curricular and extra-curricular areas; and helps the young engineer through the first years of practice."

The ECPD rejected the concept of a permanently closed membership, but urged that the future members be carefully screened.

The committee asked that an admissions group be established to screen all candidate societies and submit recommendations to the executive committee. A two-thirds vote of the executive committee and a two-thirds vote of the participating bodies then would be necessary for admission.

The constitution and bylaws committee was asked to draft the proposed changes in the charter and rules of procedure.

And in Boston

One of the primary topics of discussion at the Federation of Sewage and Industrial Wastes Association's annual meeting was Federal grant money to aid local communities in improvement of sewage treatment plants and facilities.

B. A. Poole and O. H. Hart, Indiana State Sanitary Engineers, reported that a survey of their State showed that municipal sewage treatment plant construction often was deferred during the last half of 1956, while city officials awaited the outcome of applications for Federal grants.

The State Engineers also found that since January, cities and towns not receiving Federal grants have not proceeded on sewage treatment construction because of the tight money market and the hope they would get a grant from current or future appropriations.

Under the 1956 act, Congress approved expenditures of $500 million over a ten-year period to aid communities in sewage treatment construction. Because the Federal funds have stimulated many localities into improving their situation, Poole said construction plans of 39 states over the next three years indicate that about twice the money appropriated by Congress could be used.

At a panel discussion, it was agreed that the Federal grants have resulted in a substantial improvement for many cities, but even more must be done if the country is to maintain high standards of public health in the face of a rapidly expanding population.

The panel recommended that consideration be given to an adequate Federal loan program at interest rates comparable to the 1953-56 period; or that the present law be changed to introduce a "readiness to go" factor into the present method of computing state allotments. ▲▲



Beyond Our Borders

UN Agency Builds Korean Cement Plant

Built with machinery imported from the United States, the United Kingdom, Belgium, Denmark, and Sweden, a new $9 million cement plant, Korea's largest, has been placed in operation at Mungyong, 90 miles southeast of Seoul.

Built by the United Nations Korean Reconstruction Agency, the plant will produce 200,000 metric tons of cement a year. This amount, plus the output of the Samchok cement plant on the east coast of Korea, will meet the country's major domestic demands for cement. Construction of the plant took approximately two years.



AERIAL VIEW OF KOREA'S LARGEST CEMENT PLANT WHICH PRODUCES 200,000 METRIC TONS ANNUALLY.

The plant was erected and the machinery installed under the supervision of an international team of technicians provided by the F. L. Smidth Company, of Denmark, under contract with the United Nations agency. The UN agency will continue to provide direct assistance in the initial operation of the plant by supplying ten international technicians including a training manager; chemical, electrical, and quarry engineers; and a cost accountant. Previously, a Korean plant manager and two chemists were sent to Denmark for training in large-scale cement plant operation.

The new cement plant, one of the most modern in the Far East, covers over 40 acres. The industrial complex includes tall silos, two kilns, crushers, a crane-storage building, power plant, laboratory, workshops, warehouses, and an auto repair shop.

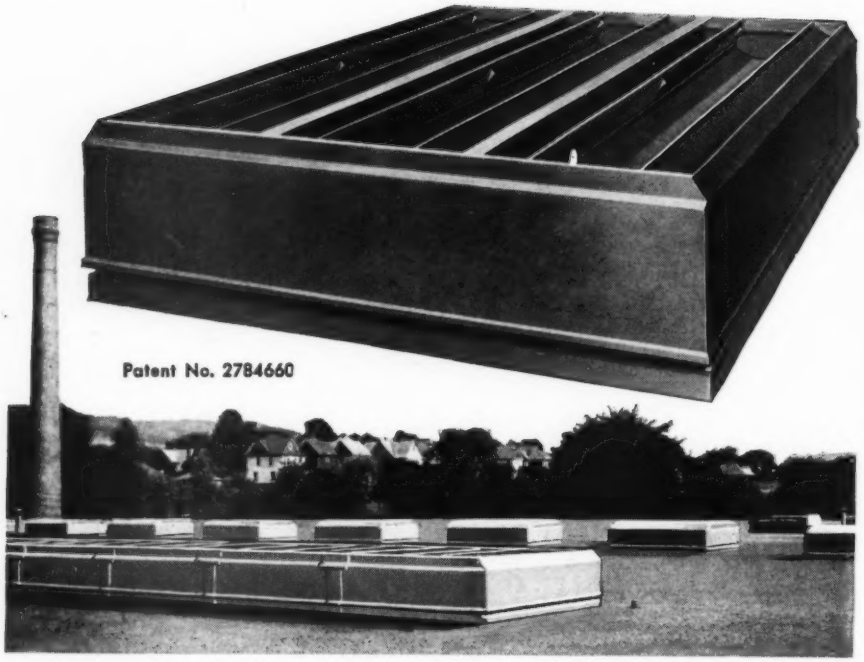
A model village near the plant has a school, community center, water system, 128 homes for plant employees, a bachelors' dormitory, and other housing for staff members and guests. Rail facilities and roads were improved as part of the total project, and an air strip was added recently.

The green valley of the Yong River was chosen for the plant site because of rich limestone deposits in nearby hills and the availability of coal from a mine a few miles away.

In preparation for the start-up of operations, engineers opened up the quarry area in June 1957. A gravity-drop chute was built from limestone hills to the valley floor, and a trolley line was laid from the hillside to the plant. The UN agency brought in drilling tools, tipping cars, and two trolley locomotives for transportation of the raw limestone to the plant's primary crushers. When the quarry is fully developed, mechanical loaders instead of manual labor will be used in loading cars with the 1500 tons of limestone required daily.

French CE's and Architects Sign Pact

Consulting engineers and architects in France have reached an agreement setting forth the fields of operation and general relationships of their two professions. The agreement was signed in Paris on July 23, with the Chamber of Consulting Engineers of France and the Society of Consulting Engineers



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of the State and the Communities representing the engineers and the Superior Council of the Order of Architects and the General Confederation of French Architects representing that profession.

The agreement broke various types of construction work down into four categories:

A. General non-technical construction work.
B. Residential, administrative, public, educational, research, and charitable buildings.
C. Industrial establishments.
D. Technical structures such as dams, bridges, railroads, piers, waterworks, highways, and sewers.

The agreement puts the architect in over-all charge of categories A and B but requires that the architect make use of a consulting engineer for all technical design work in category B. All work in category C may be under the supervision of either the architect or the consulting engineer at the option of the owner. For work in category D, the consulting engineer is in over-all charge, but he is expected to make use of an architect for any aspects of the work that require esthetic or other architectural considerations.

On those jobs in which the architect is in general charge, he is permitted to select his own engineer, and wherever the engineer is in charge, he may select his own architect unless in either instance there is prior agreement with the owner to the contrary.

When the architect is the general supervisor of the project, the collaboration of the engineers may be limited to their particular fields of technical activity or may be extended to include intervention in other phases of the work.

When the consulting engineer is in general charge, the collaboration of the architect will apply to the general composition, the forms and proportions, and the selection of certain materials.

Whoever is in charge of the project is expected to be respon-

sible for the payment of the professional man engaged by him. On all joint ventures the owner is personally responsible for the payment of both the consulting engineer and the architect.

It has been decided that a board of arbiters will settle disputes, the board being made up of a member of the Regional Council of the Order of Architects, and a member of the Board of Directors of the Chamber of Consulting Engineers of France. If these two cannot agree, a third arbiter is selected, by casting of lots, from a list of five members from the Regional Council of the Order of Architects, and five members of the Board of Directors of the Chamber of Consulting Engineers.

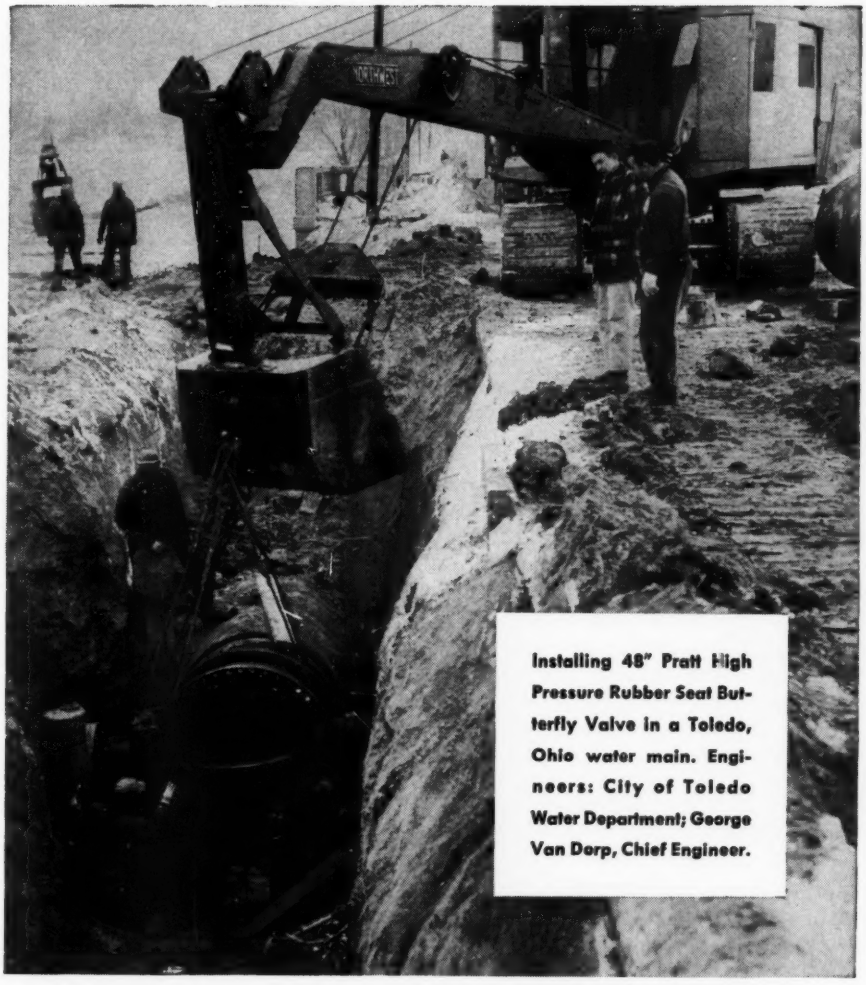
This is the first time that a formal protocol agreement has been established between architects and engineers in France, and it is hoped that it will lead to better understanding and fuller cooperation between the two professions.

Power from the Sea

Plans for exploiting differences in temperature between the top and bottom of the Dead Sea and the Gulf of Eilat for the generation of electricty are under consideration by the Israeli Ministry of Development. The Dead Sea seems to be particularly promising because the temperature at the surface reaches 40 C or more during the summer while at a depth of 100 feet the temperature is constant at 20 C.

A difference in temperature of 15 to 20 degrees C is enough to operate a carefully designed turbine, which can be used to drive a generator for production of electricity. In addition, by using suitable condensers, it should be possible to produce fresh water as a by-product.

A scheme of this kind has been tested by the French and a power station will be completed next year at Guadeloupe. M. Beau, director of the French enterprise Energie de Mer, has been in charge of the French experiments.



Installing 48" Pratt High Pressure Rubber Seat Butterfly Valve in a Toledo, Ohio water main. Engineers: City of Toledo Water Department; George Van Dorp, Chief Engineer.

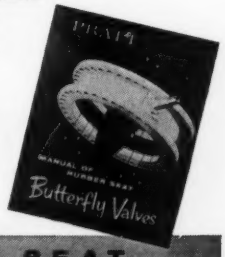
TOLEDO...Chooses Henry Pratt Butterfly Valves for Water Mains

Long after this valve is buried, in six months or sixty years, it will still be **easily opened or closed by one man using a standard tee-wrench.** The design features of Pratt Valves are aimed at the kind of honest dependability you need for water main use... the disc edge is corrosion-resistant and seats accurately in a rubber liner made extra-heavy to prevent permanent set. The one-piece stainless steel valve shaft rotates in lifetime lubricated bronze bearings, and the operator is permanently lubricated and sealed to withstand seepage.

In 1956, the City of Toledo purchased 13 Pratt Rubber Seat Butterfly Valves for its water mains, in 24", 30", and 48" diameters. All of them were designed for buried service without the need for protective vaults around valve or operator, **adding substantial savings in installation costs** to their proven freedom from maintenance problems.

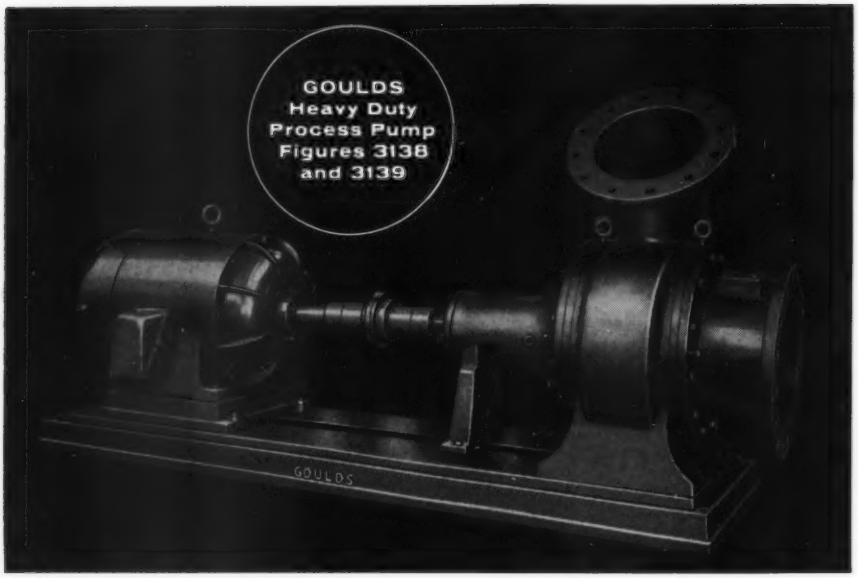
Pratt engineers stand ready to help you select valves for distribution service or any water works application. Call on them with your next valving problem.

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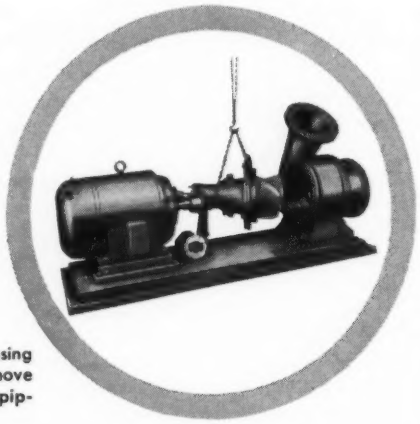
Self-venting discharge ends air-binding, insures steady flow. Ejector vanes keep solids away from the back wall of open, nonclogging impeller. Impeller-to-sideplate clearance externally adjustable. Hook-type shaft sleeve contracts or expands with temperature changes, fully protects shaft.

For pumping corrosives

Goulds Fig. 3138-39 pumps are available with fluid ends in all iron, bronze fitted, all bronze or Type 2 Ni-Resist, nickel-aluminum-bronze, steel and steel alloys (all sand cast machineable alloys).

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Full details in Bulletin 723.4.



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Recently he spent two weeks in Israel to survey the possibilities of the project.

The Dead Sea is ideal in that the temperature difference is great and cool water can be obtained close to the shore and at no great depth. Its only disadvantage is that suitable conditions exist only for about six months yearly.

In the gulf of Eilat, the temperature difference between the upper and lower layers is less than in the Dead Sea, but is maintained throughout the year.

It is unlikely that any actual construction work will be carried out until the results of the Guadeloupe station are known although the Dead Sea Bromine Co. is planning a small experimental station at Sodom.

Tanganyika Port Improvement

The East African Railways and Harbors Administration will spend upwards of $1 million in a series of projects designed to improve the port of Dar es Salaam, Tanganyika. The improvements consist of a rail siding linking the deepwater berths with a warehouse and industrial area, a new pier for handling bulk petroleum products, construction of new port offices, and replacement of the old wharf with a new structure.

In addition to providing rail facilities consisting of a 4000-ft single line siding and two rail spurs (and making provision for five additional spurs when such are required), another important improvement is the bulk oil pier. This is scheduled for completion in the first quarter of 1958 and will replace the floating pipeline system now in operation. Situated about halfway between the deepwater berths and the dockyard, it is 850 feet long and will be a T-head measuring 200 by 30 feet into which the pipeline facilities go.

The pier, to cost about $500,000, is designed as a composite structure of 18-in. square steel piling with precast concrete capping beams and road slabs. It is planned to carry a 16-in. fuel oil

pipeline, a 10-in. heavy diesel pipeline, a 12-in. pipeline for gas oil, a 12-in. unnominated pipeline, and a pipeline for fresh water.

The pierhead will include two 40-ft observation towers. Foamite generators on the pierhead will be operated with seawater to provide facilities for fire fighting. Booster pumps and housing will be incorporated into the project, and at the shore end of the pier small boat steps with breakwater protection will be built.

When dredging operations are completed, water alongside the pier will be 35 feet deep, which is sufficient to accommodate vessels of up to 24,000 tons displacement. Vessels will be moored to two Peine dolphins set in the harbor off the pier. This type of dolphin, constructed of high tensile steel to take up a ship's movement, is new to East Africa. The mooring load also will be taken up by two 70-ton bollards set into the pier, and the vessel will rest against gravity fenders set into the T-head.

Construction also has begun on a new 175-ft T-head pier to replace the old small-boat wharf built in 1949. This pier, to cost $67,000, is designed with levels for high and low water and is being built of 12- x 12-in. concrete piles with steel braces and decked with timber.

Soviet Translating Machine

A member of the Soviet Academy of Sciences, Vladimir Alexandrovich Kotalnikov, has described what he thinks may be the future achievement of Soviet scientists and engineers in the construction of a translating machine.

The machine would be no bigger than a typewriter and would stand on the desk. Pressing a button would activate it. One would talk into the machine on any subject, including science and technology, asking questions and leaving sentences unfinished. When a second button is pressed the machine would eject sheets of typescript — an exact record of

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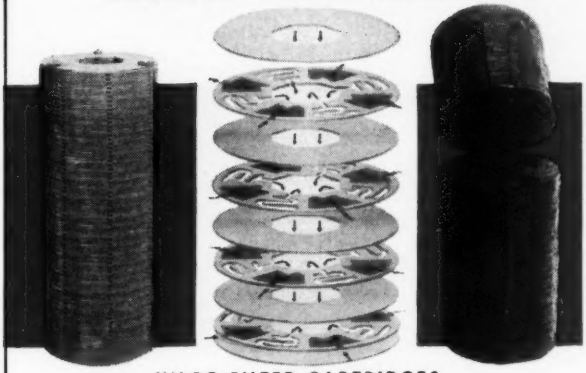
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HILCO FILTER CARTRIDGES

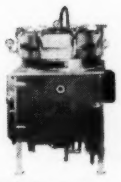
The result of much research in the field of lubricating, fuel and industrial oil filtration, the new patented HILCO Filter Cartridges meet the need for tremendous filtering area, low pressure drop and high dirt storage capacity. Above: Fig. 1 is a new cartridge; Fig. 2 is a used cartridge (note that pockets are completely filled and the outer surface covered with solids); Fig. 3 shows the flow of oil, the dark area represents dirty oil passing into the pockets while filtered oil (white area) passes into "S" shaped section.

HILCO Purification Means *Complete* Oil Purification . . .

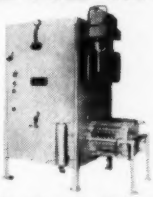
You get absolute removal of sludge, acids, carbon, water and fuel dilution with a properly selected HILCO. Clean oil saves you money. Expensive maintenance is reduced, equipment shut-downs practically eliminated, lost man hours and cuts in production become a thing of the past. HILCO continuous, all electric, automatic purification keeps your oil clean and in top condition at all times. You receive the full capacity and economy of your equipment.

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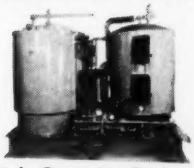
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3 HOW TO SOLVE THE BIG PROBLEMS of Heating System Design



KEEP COSTS DOWN

The cost of Reznor unit heaters is comparable to or lower than that of other types of equipment of equal heating capacity. And with Reznor, this is the total cost. You don't have to add the costs of extensive piping and valves or duct work, and of radiators or registers. Reznor gas unit heaters produce and distribute heat at the point of need. To install them involves only suspension, venting and utility connections. So installation costs are much lower than those of central heating systems. Lower equipment cost . . . lower installation cost . . . two reasons why Reznor gas unit heaters can offer substantial savings on heating systems for so many commercial and industrial buildings.

SAVE SPACE

Reznor gas unit heaters are installed up at the ceiling, completely out of the way. When you design for a store or factory, you don't have to allot a single square foot of valuable space for heating equipment . . . and you don't have to keep floor or wall areas clear for radiators or registers.

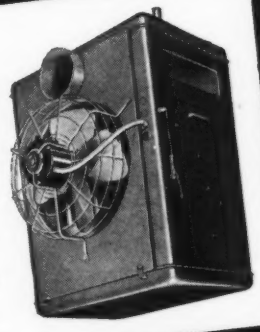
INSURE FLEXIBILITY

When you specify Reznor gas unit heaters you don't have to choose between a heating plant which is over-sized and over-priced for current requirements and one which may not be adequate for future needs. With Reznor unit heating, when that new wing is added, additional heaters are installed. It's as simple as that. And in the case of internal remodeling, it's very easy and inexpensive to relocate the existing heaters.

ONLY REZNOR GAS UNIT HEATERS OFFER ALL THESE ADVANTAGES

- Clean, modern design, back as well as front . . . all controls and connections inside the cabinet.
- FlexiTemp control system with automatic two-speed fan control to provide nearly continuous air circulation and minimize temperature fluctuations (optional).
- No costly frills and gadgets . . . features which are needed only to meet special situations always separately listed and priced.
- Fan or blower models in ten sizes from 25 to 300 thousand BTU.

There is no "equivalent" for Reznor gas unit heaters.



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WORLD'S LARGEST-SELLING DIRECT-FIRED UNIT HEATERS
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for complete details, wherever you are . . .

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the conversation. The mythical machine also could correct badly constructed sentences. Two of the sheets ejected would contain a translation of the text in Latin and English.

Such an automatic machine, said the Academician, is no idle fantasy. There are already in existence machines that can translate texts from one language into another, but they are still very cumbersome, have an inadequate vocabulary, and are used mostly for translating scientific texts. It should be possible, eventually, to construct a machine for literary purposes, since construction of a sentence is subject to certain laws, and a machine is able to observe any laws dictated to it. For the moment, he admitted, these machines cannot obey the human voice and only operate on code.

Concrete Beams Without Forms

Continuous 100-yard lengths of prestressed concrete beams are now being made in England by a process that makes molds unnecessary. The concrete is extruded from a traveling machine on to flat beds; when the beam has been cured it is automatically fed to a saw table that cuts off the required lengths. The pneumatically driven machine is suspended from an overhead gantry. Present cutting facilities allow lengths up to 30 feet. The plant can produce 1700 feet in an 8-hour day.

Prepare for World Shipping

In a move designed to attract worldwide shipping to western Japan, the Japanese Ministry of Construction has blocked out an 87 million yen (approximately $241,750) three-point construction program which calls for the widening of the Japan Mainland-Kyushu Channel.

The program calls for:

¶ Deepening of the channel to 33 feet, although eventually the overall depth is to be at least 39 feet. At present some parts of the channel are only 28.5 feet deep.

¶ Widening the channel from its

present 1640 feet to 3280 feet. ¶ Moderation of the current of the channel, which flows at eight nautical miles an hour.

The Ministry of Construction already has appropriated 14 million yen for the current fiscal year to begin dredging and widening operations in the Shimonoseki-Moji Channel, which runs between Kyushu and the Japanese Mainland.

Concurrently, in cooperation with the appropriate prefectural authorities of Yamaguchi, the Kyushu area, and prefectures along the Inland Sea, an extensive publicity campaign will be launched to attract world shipping to western Japan. Coastal facilities and port improvement projects also are being planned to capitalize on the channel improvement.

Improvement of the Shimonoseki-Moji Channel, as well as completion of the new underground tunnel between Kyushu and the mainland are scheduled to open March 1, 1958. This work, plus the additional railroad tunnel planned for the same area, is expected to improve substantially the economic position of western Japan.

Consultants Sought for Pipeline

An agreement has been reached between Iraq and Saudi Arabia calling for the construction of a 465-mile water pipeline from a point on the Euphrates River near Suq al-Shuyukh in Iraq to Riyadh, Saudi Arabia. Over-all cost of the project is estimated at $28 million.

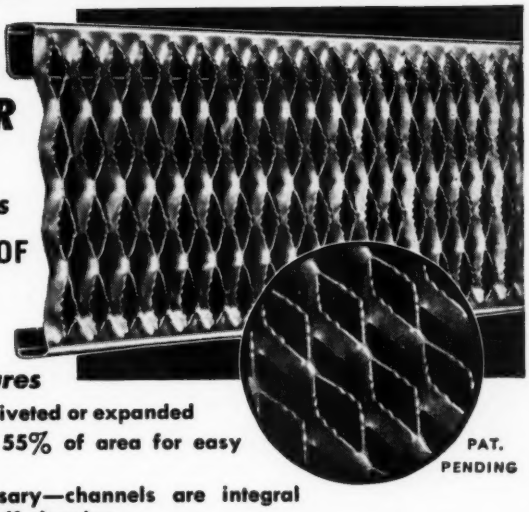
The Saudi Arabian Government, which largely will be responsible for constructing the project, is seeking the services of a consulting engineering firm to make a thorough study of the practical aspects of the projects. United States firms interested in participating in any phase of the engineering or construction supervision of the proposed pipeline can obtain information from the U.S. Embassy in Jidda, Saudi Arabia.

Preliminary plans indicate the work will include two, 32-in.

two superior open steel
FLOOR GRATINGS
BY GLOBE

1 Safety GRIP-STRUT®

FOR MAXIMUM SAFETY ALL OVER YOUR PLANT



Important Safety Features

★ FIRE PROOF ★ SLIP PROOF
★ MAXIMUM STRENGTH
★ MINIMUM WEIGHT

Important Economy Features

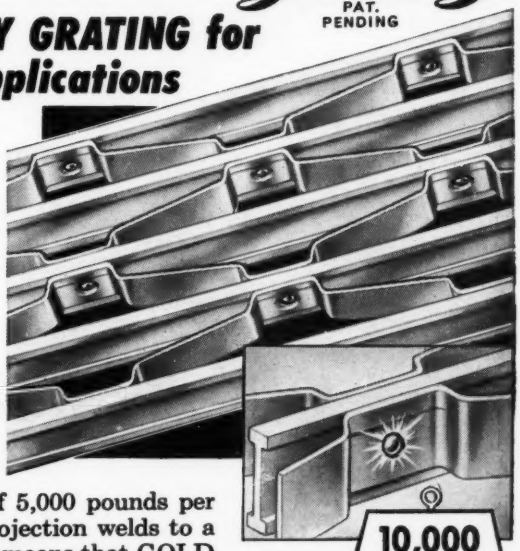
★ All one piece, not welded, riveted or expanded
★ Open space in excess of 55% of area for easy access of light and air
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Ideal for work platforms, stair and ladder steps, flooring, balconies, catwalks, machinery guards, fire escapes and for original equipment safety treads.

2 GOLD NUGGET® WELDED grating
PAT. PENDING

The QUALITY GRATING for Heavy Duty Applications



★ 3/8" projection weld nugget for greater rigidity and strength
★ Vertical alignment of the main load bar assured
★ All bars are load carrying bars including secondary bars
★ Anti-skid pattern

PROJECTION WELD

Each secondary load bar (A), as projected welded to the primary load bar (B) has a shear strength of 5,000 pounds per weld. There are 28 such projection welds to a square foot of grating. This means that GOLD NUGGET Welded Grating can sustain greater shock loads than other gratings.

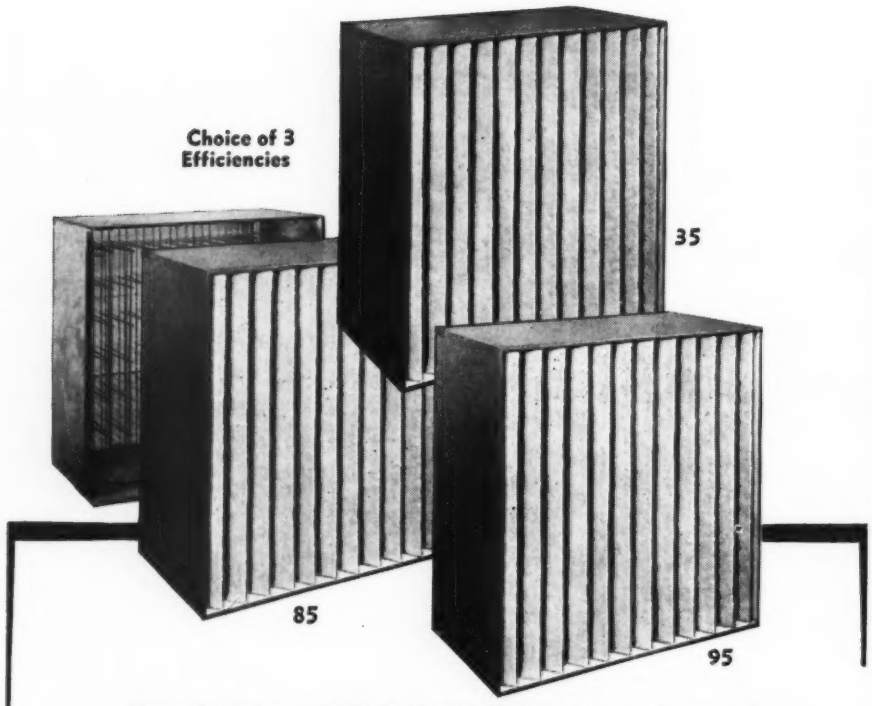
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Cambridge AEROSOLVE® Filter Cartridges are INTERCHANGEABLE

...Your Safeguard against Changes in Supply Air... or Process Requirements

Even if you know the exact amount of each type of dirt in the supply air, you have no assurance that it won't change next month or next year.

Even if you know exactly how clean the air must be for your comfort conditioning or process, you can't be sure what the future requirements will be.

With other air-cleaning systems, any necessary change in efficiency can be very costly. But with Cambridge AEROSOLVE Filters, it is simply a matter of substituting filter cartridges of higher or lower efficiency as required. No further changes in the filter system are necessary.

Or you might find that inexpensive pre-filters, which can be added at any time, will be economically advantageous.

High Efficiency at Low Cost

The annual owning and operating cost of Cambridge AEROSOLVE Filters is only a fraction of the cost of other high-efficiency filtration equipment, so that practical consideration can now be given to high efficiency on all process and comfort conditioning jobs.

Write for Bulletin 120

Cambridge Filter Corporation

730 E. Erie Blvd., Syracuse 3, N. Y.

Also Makers of the Famous ABSOLUTE® Filter — World's Most Efficient Air Cleaning Device

REPRESENTATIVES IN PRINCIPAL CITIES

pipelines, a purifying and pumping station near the starting point, several pumping stations along the way to speed the flow of water, and outlets for irrigation in cultivable areas. The project will supply Riyadh with 30 to 40 million gallons of pure water daily.

Tenders to be Called

The Snowy Mountain Hydro-electric Authority, Australia, is calling for bids this year for the construction of the T-2 power station, involving the erection of a concrete diversion dam 140 feet high, a headrace tunnel three miles long, an underground power station to accommodate plant with a capacity of 280,000 kw, and a four mile tailrace tunnel.

Harbor Improvement

The Freemantle Harbour Trust (West Australia) has started construction of a $2 million overseas shipping terminal as part of a $6 million harbor improvement scheme. The main building is to be completed by 1959, to coincide with the arrival of the new 45,000-ton British liners.

Portable Crushing Plant

Wombe Shire in Queensland, Australia, remote from known gravel deposits, carried out an extensive search for materials suitable for road building. Although no new gravel deposits were found, two large deposits of columnar basalt were uncovered nearby. The Wombe Shire Council purchased a Goodwin-Goliath portable multi-unit crushing plant consisting of primary, secondary, and auxiliary screening units, each unit self contained.

The plant, capable of processing about 250 cubic yards a day, paid for itself in savings in less than three months. It produces aggregates from 2½ down to ¾ inches and can be moved from one site to another without dismantling.

The shire now supplies all its own needs plus enough excess to supply the Main Roads Commission and adjoining shires. ▲▲

News for the Consultant



Elevated Grade Crossings Eliminate Traffic Congestion

A major grade crossing elimination project of 1.8 miles has been completed through the City of Fort Wayne, Ind.

Fort Wayne is a division point on the Nickel Plate Railroad and is traversed by the road's two main tracks extending from Buffalo to Chicago. Both through and local passenger and freight trains pass over these tracks. The passenger station is located in the business area and other division facilities are at various points along the road inside the city limits.

To reduce property damage, the two main tracks were elevated approximately 17 feet. The elevation consists mostly of embankment, but for economic reasons there is an elevated structure through the business area of concrete pier and steel beam construction. It is 1970 feet long and has 44 beam spans with ballasted concrete deck.

Main tracks here are on 30-ft centers to provide for a station platform and necessary station facilities. The elevated structure crosses three streets in which clear openings were requested. These required 70-ft spans. There are 3-span (50-, 70-, 50-ft) continuous beam bridges for each of the streets with simple spans for the rest of the structure. Through girder spans provide clear openings at three streets while a 3-span ½-through girder bridge provides for dual traffic lanes on two of the state routes. All street openings provide 14-ft under-clearance.

Side tracks were designed for switching and loading cars from the second and third floors of adjacent buildings.

Construction was so coordinated that all work was done with the least possible interference to the contractors and to railroad and vehicular operation. This was accomplished by a four-stage construction schedule. The railroad operated on a single track throughout the entire area. During each stage of construction track was relocated clear of work.

Cost of the project was estimated at $8 million, but actual construction was about $7.5 million.

Concrete piers for the elevated structure are supported by foundation piling manufactured by Armco Drainage & Metal Products, Inc. Approximately 30,000 feet of 12¾-in. OD, .250-in. wall piling was used. The piles were driven to refusal by a Vulcan No. 1 Hammer. Ends were closed with ¾-in. plate.

Plans for the project were prepared by DeLeuw-Cather & Co., Consulting Engineers, Chicago. All



LEFT, TYPICAL GRADE CROSSING BEFORE TRACKS WERE ELEVATED; RIGHT, ELEVATED STATION OVER CROSSING.

DEPENDABLE
100% AUTOMATIC
REMOTE READING
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Liquidometers use a temperature compensated balanced hydraulic system. Indications unaffected by changes in specific gravity. All models feature large easy-to-read dials. UL approved switches available.

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Burgess-Manning Pulsation Snubbers are products of 20 years of specialization—and engineered to your specific piping pulsation problem. They eliminate the cause of your trouble at the source with resulting improved equipment efficiency, increased production, reduced maintenance and elimination of operating hazards.



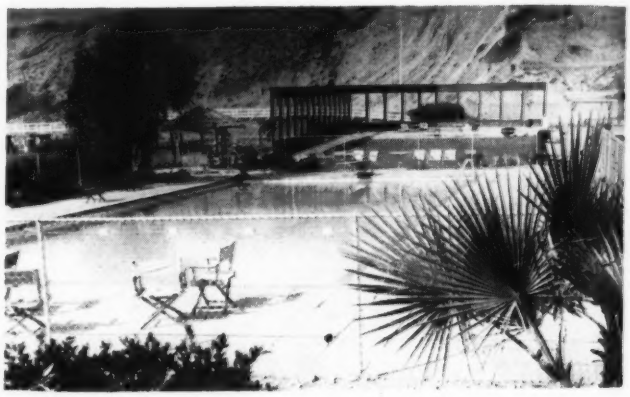
BURGESS-MANNING COMPANY
763 East Park Avenue, Libertyville, Illinois
Dallas, Texas

work, exclusive of highway facilities, was done under the supervision of the railroad's chief engineer, H. F. Whitmore. All highway work was done under the supervision of the heads of the engineering departments of the City and Allen County.

Swimming Pool Design Provides for Heaving Ground Possibility

A swimming pool design to allow periodic releveling and alignment has been successfully installed at an exclusive Pacific Coast club where heaving ground last year completely destroyed a rigid concrete pool.

Each side of the 75-ft pool is made up of three concrete beams 25 feet long abutting each other.



POOL IS AS ATTRACTIVE AS FORMER RIGID TYPE.

Each section has its own coping and scum gutter. The sections are held in place by adjustable anchors.

The ground at the bottom of the pool is covered with six inches of fine sand. Inside of the pool is finished with a blue vinyl liner.

Design and engineering was by Mackintosh & Mackintosh, consulting engineers, of Los Angeles.

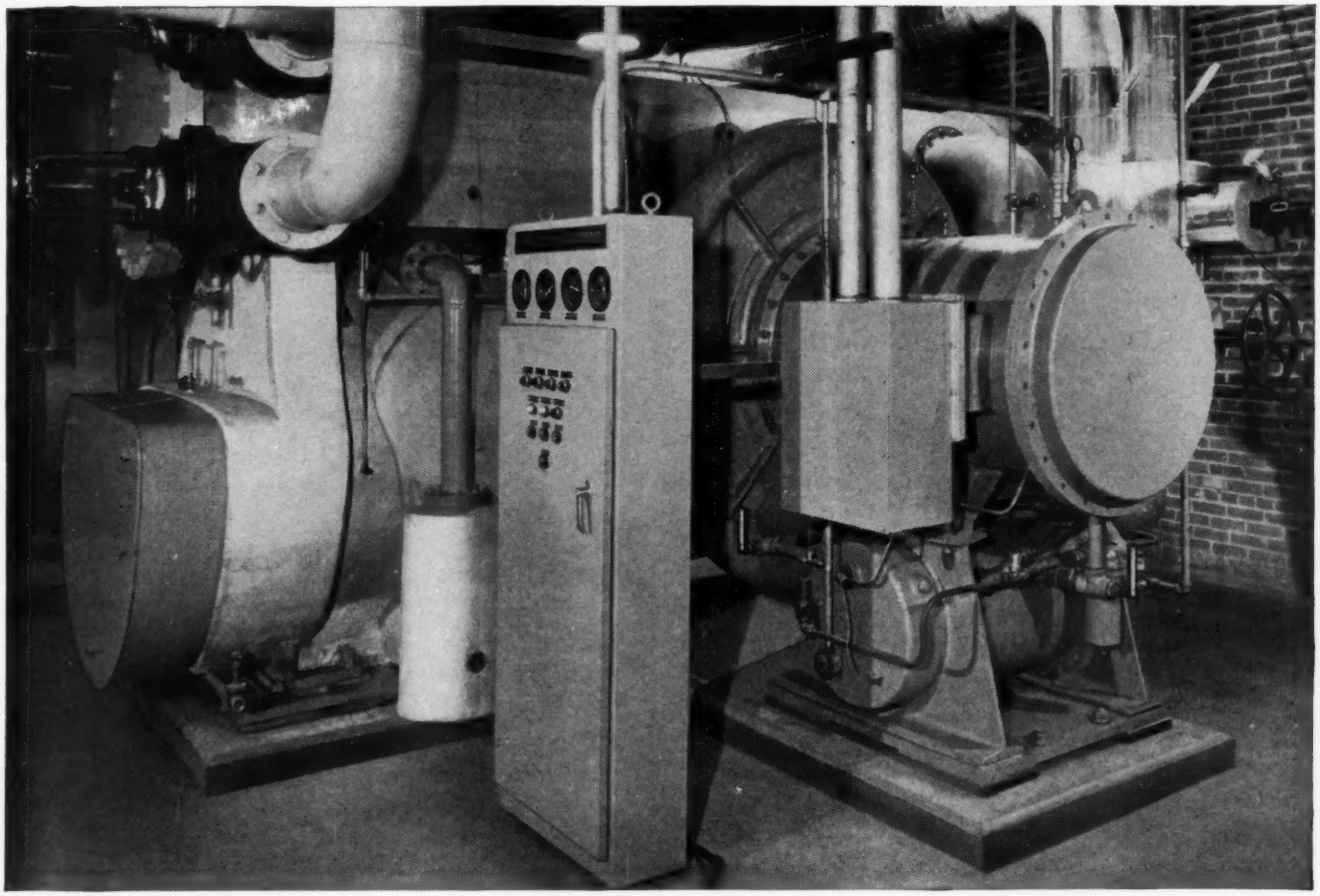
Efficient Power System The Key to Increased Steel Profits

Steel producers, through more efficient production and use of their mill-produced power, can tap overlooked profits, according to a report presented at the Annual Convention of the Association of Iron and Steel Engineers, by R. W. Worley, Chief Power Engineer, and H. G. Kitt, Senior Power Engineer, of United Engineers & Constructors, Inc., Philadelphia, Pennsylvania.

Entitled "Trends in Steel Mill Power Plants," it discussed seven ways to increase steel producers' profits by reducing power costs:

¶ Increase use of available by-product fuels — such as blast furnace gas which can be used to fire boilers

AMERICAN BLOWER AIR CONDITIONING



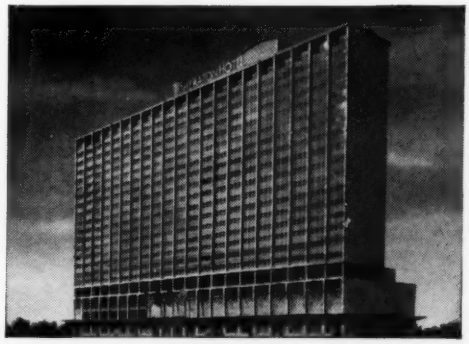
Two 350-ton American Blower Tonracs supply chilled water for the entire Sheraton air-conditioning system.

Tonrac®—heart of the air-conditioning system in Philadelphia's new Sheraton Hotel

To help extend a traditional Sheraton welcome to travelers in the City of Brotherly Love, engineers, builders and mechanical contractors selected two American Blower Tonrac Centrifugal Refrigerating Machines to supply the air-conditioning system in the new Sheraton Hotel.

They chose Tonracs on the basis of their high capacity; their quiet, vibration-free operation; and American Blower's engineering know-how and reputation as a leader in the air-handling and air-conditioning field. The Tonracs supply all the chilled water for 1,000 individual American-Standard Remotaire room units that air-condition 5,700,000 cubic feet of space.

When your client's plans call for air conditioning—call our nearest branch office for invaluable product information. American Blower Division of American-Standard, Detroit 32, Michigan. In Canada: Canadian Sirocco products, Windsor, Ontario.



The 22-story Sheraton Hotel, Philadelphia. Tonracs, installed on the fourth floor, operate so quietly that guests on adjoining floors never hear a sound.

Building Credits
Architects: Perry, Shaw, Hepburn & Dean
Consulting Engineers: Slocum & Fuller
Builders: McCloskey & Co.
Mechanical Contractors: Ambrose-Augusterfer Corp.

AMERICAN BLOWER

Division of AMERICAN-Standard

QUALITY PROTECTS YOUR INVESTMENT . . . AMERICAN-Standard QUALITY IS AVAILABLE AT NO EXTRA COST



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INDUSTRY'S NEW ELEMENT!

...the magic element of Colorado Climate, the element that gives Colorado Industry the advantages of greater worker productivity, fast growing new markets...and the BONUS of Pleasant Living. Before selecting your plant location, discover all the elements of success awaiting your industry in Colorado, the state that more than meets your site requirements.

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MISTKOP STOPS MIST
COLLECTS MIST-FOG EFFECTIVELY IN A SMALLER SPACE



This efficient Mistkop unit provides low-cost mist control for all machining operations employing coolants or lubricants. Requires no duct work or costly piping—*is actually portable!*

Mistkop is sturdy in design—has a minimum number of parts and gives long, trouble-free service. Stops clouding of lights . . . eliminates fire hazards of uncontrolled mist. Write for detailed description.

AGET Manufacturing Company
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and cut consumption of expensive purchased fuels.
¶ Use high-pressure steam systems — first to power turbogenerators, then to supply plant low-pressure requirements.
¶ Install modern high-pressure, high-capacity blowers to supply more than one blast furnace.
¶ Use often wasted blast furnace gas to power gas turbine engine-generators.
¶ Conserve cooling water and pumping power by using smaller quantities in winter when lower temperatures afford the same cooling with less water.
¶ Design water preparation plants for high-efficiency, minimum maintenance boiler operation.
¶ Standardize electric power system frequency at 60 cycles for ease of interconnection with utilities, for simplified maintenance, and for faster delivery of new or replacement equipment.

Worley and Kitt also pointed out the importance of steel mill power plants resulting from the industry's tremendous and continually expanding use of power. Producing and rolling one ingot ton of steel, for instance, requires as much as 200 kilowatt-hours of electric power. Total industry consumption during 1956 was about 20 billion kilowatt-hours — equal to three percent of the installed capacity of the entire country's electric utilities.

Short Courses for the Engineer

The 2nd National Short Course on Prestressed Concrete, co-sponsored by the Department of Civil Engineering, University of Florida, and the Prestressed Concrete Institute, will be held January 27-31 at Ellinor Village, Daytona Beach, Fla.

The course will offer an opportunity for the practicing engineer and architect to become familiar with theory and design.

Speakers will discuss specifications, standardizations, quality control, and the design of bridges, industrial buildings, lift slabs, and unusual structures. A field trip to a casting yard in the area is planned to acquaint registrants with current manufacturing methods.

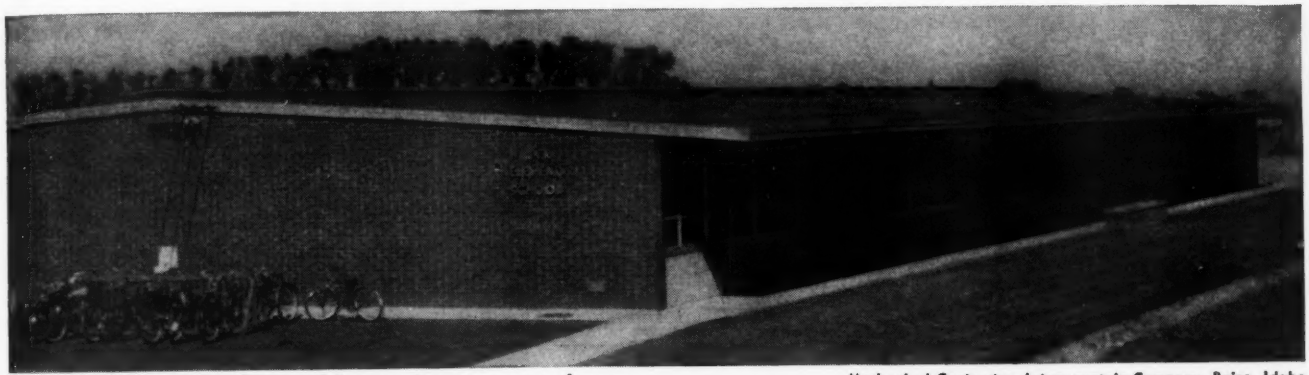
Registration fee of $10.00 must be sent before January 1st to Prestressed Concrete Short Course, Civil Engineering Dept., University of Florida, Gainesville, Fla.

An Engineering and Management Course, a two-week intensified program designed to prepare personnel for higher management responsibilities, will again be held on the Los Angeles campus of the University of California, January 27 to February 6, 1958.

Study arrangements include a ten-day course from 8 a.m. to 5 p.m; four 1½-hour instruction periods plus a luncheon meeting daily and approximately 25 different subject offerings with a daily instruction period for each subject for the full ten days. The total number of persons admitted and the number

GILSULATE® helps another modern school hold costs to $10,000 per classroom

All underground steam lines protected with GILSULATE Insulation System



MODERN WILDER SCHOOL features 6-foot overhang on east and west as weather protection, 5-foot wide walks; each classroom has outside entrance. Exterior is brick veneer and concrete.

Mechanical Contractor: Intermountain Company, Boise, Idaho
General Contractor: L. H. Krieger Construction Company, Nampa, Idaho
Engineer: Kendall M. Wood, Spokane, Washington

"...this type of installation helped keep our costs down."

Harold G. Thompson, Architect, Boise, Idaho.



900-SQ. FT. CLASSROOMS feature plastic skylights and 12-500 watt concentric ring fixtures; continuous wall heating and a mechanical ventilation system. Total building area is 12,416 sq. ft.

Surveys show that most modern classroom construction costs average well over $30,000 per classroom. Yet the Wilder Elementary School in Wilder, Idaho, containing 11 classrooms, an administrative suite, plus separate boiler house, cost only $116,827! GILSULATE insulation was used on all the underground steam supply lines between the central boiler plant and other buildings. This remarkable cost level was also achieved at the Cadott School in Wisconsin—another GILSULATE installation.

The Wilder School installation consists of a 5-inch steam line and a 1¼-inch condensate return running for 156 feet from the boiler house to the school, and a 6-inch line and 1½-inch condensate running for 120 feet between the boiler and high school. The entire job required 17 tons of Type A GILSULATE, and took 21 man hours to install, plus 2 hours for a grader to backfill the trench.

Whatever type of job you have in mind—airport, school, utility, institution, factory, railroad—it will pay you to investigate the unusual features of this easily-installed, dependable, low-cost insulation system. Write for further information or see your local GILSULATE dealer.

FACTS ABOUT GILSULATE

1. EASY TO USE—just pour and tamp... pipe heat does the rest.
2. FORMS 3 ZONES of protection against heat loss and all hazards commonly encountered by hot buried pipes.
3. NEEDS NO HOUSING OR MECHANICAL SHEATHS: no mixing, special handling or equipment.
4. ONLY NEEDS NORMAL PIPE SPACING: for multiple pipe or cramped conditions.
5. THREE TYPES AVAILABLE:
   Type A for 220°-300°F. temp. range
   Type B for 300°-385°F. temp. range
   Type C for 385°-520°F. temp. range

THE TRIPLE-ZONE INSULATION SYSTEM FOR LIFETIME PROTECTION OF UNDERGROUND HOT PIPES

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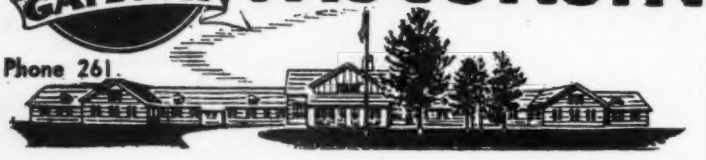
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permitted to enroll in any subject will be controlled in order that each person may have maximum opportunity for full participation. The course is designed to be of value to most levels of engineering and management personnel.

Subjects covered during the period will include General Management Principles, Engineering and Research Administration, Managerial Adjustment to Labor Law and Union Relations, Leadership Principles, the Economics of Plant Investment and Equipment Replacement, and a Laboratory in Leadership, as well as specialized instruction in motion study and simplification of work, work measurements, and allied topics.

Information concerning course material and housing during the conference period, as well as registration details, is available on request to Edward P. Coleman, Engineering Extension, Room 3104, University of California, Los Angeles 24, Calif.

Hertz Sets Up Fund To Aid Engineering Students

More than 100 engineering students a year are expected to benefit from the multi-million dollar foundation being set up by John D. Hertz, founder of the Yellow Cab Co. and the Hertz U-Drive-It system.

Present plans are to finance training of mechanical and electrical engineers.

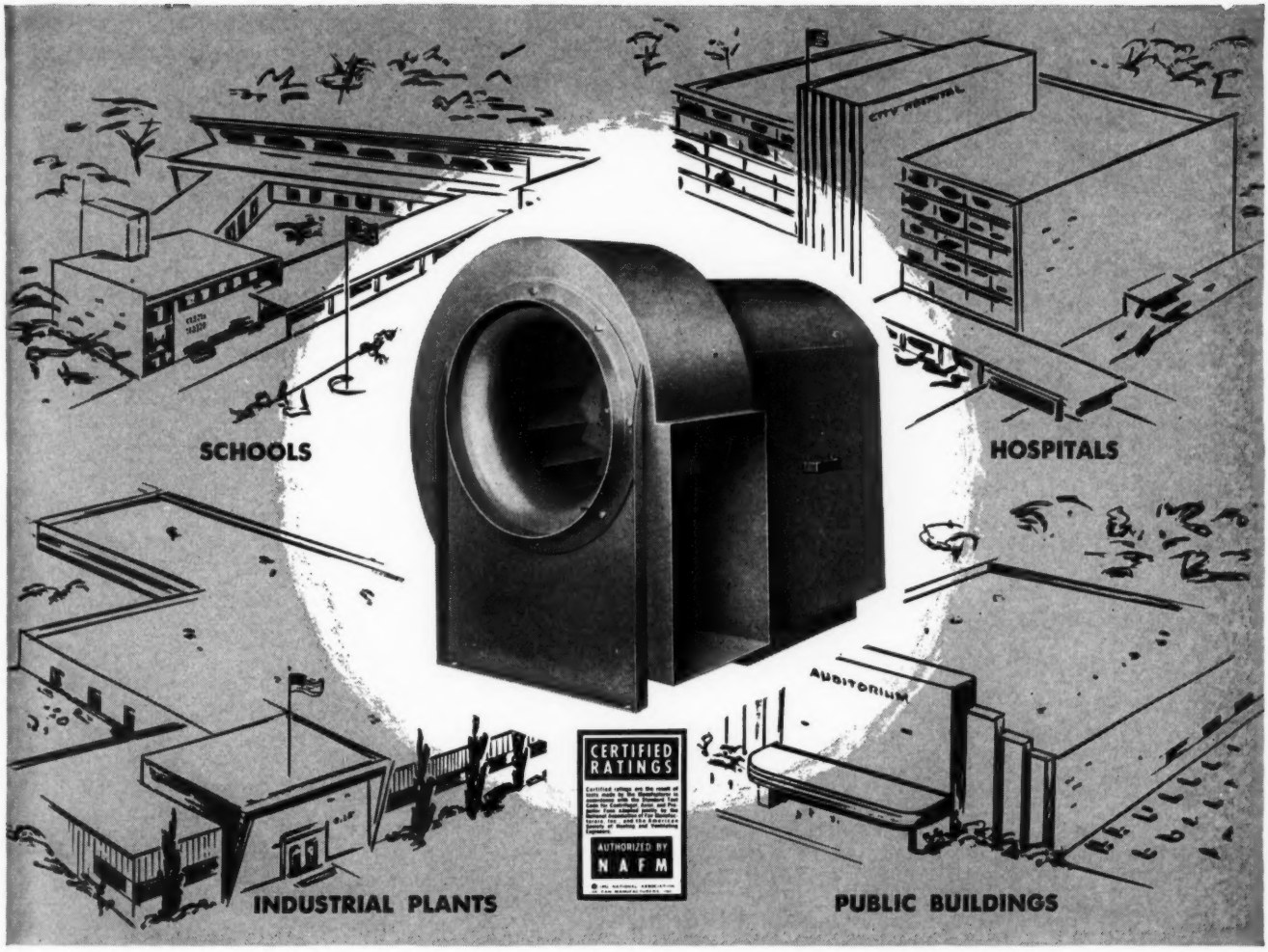
Consulting Engineers Council's Shortage of Engineers Committee is contacting Mr. Hertz with the plea that he broaden the foundation to include assistance to students in all branches of engineering and to offer special instruction for students interested in entering private practice.

ASHAE Research Laboratory Completes Fan-Noise Study

The American Society of Heating and Air-Conditioning Engineers and the American Society of Refrigerating Engineers joint committee appointed to prepare a standard for measuring the sound output of air conditioning equipment will be guided by the data developed from a fan-noise program conducted at the ASHAE Research Laboratory, Cleveland, Ohio. The ASHAE program was an investigation of four methods for determining the acoustic power output of a fan by octave-band analysis.

Previous standards for rating the noise output of fans were based only upon over-all levels. Experience has shown that frequency distribution of their sound spectrum also is important both from the standpoint of loudness and annoyance and in choosing the type and method of acoustic treatment needed to reduce the noise level.

The relationships between noise level and frequency distribution, and their effects on annoyance,



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Quiet, dependable, trouble-free Peerless blowers require a minimum of installation space and reduce mounting costs. They offer countless discharge arrangements. The entire unit is built by Peerless, including the motor.

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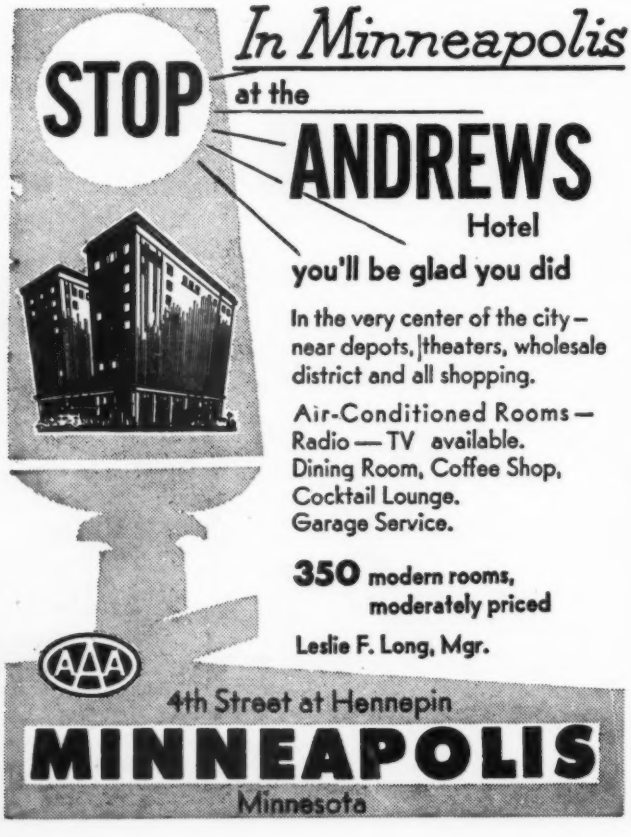
Name .....

Company .....

Title in Company .....

Company street address .....

City ..... **State** .....



speech interference, and speech audibility, are being established by various investigations throughout the country.

In an air-conditioning system the common noise source is an air-moving device, such as a fan or blower, and the noise path may be the duct system.

Since criteria have been established regarding annoyance and its relationship to noise level and frequency distribution for different types of environments, it follows that for effective noise control in an air conditioning system, in order to obtain a desired criteria, the acoustic characteristics of the duct system and the noise output of the fan must be known or easily measured.

Contemplated as a future phase of the ASHAE program is the study of sound transmission through duct walls, the noise attenuation of lined and unlined ducts, and the generation and attenuation of sound at branch takeoffs.

Consultants Study Use of Computers For Highway Design Problems

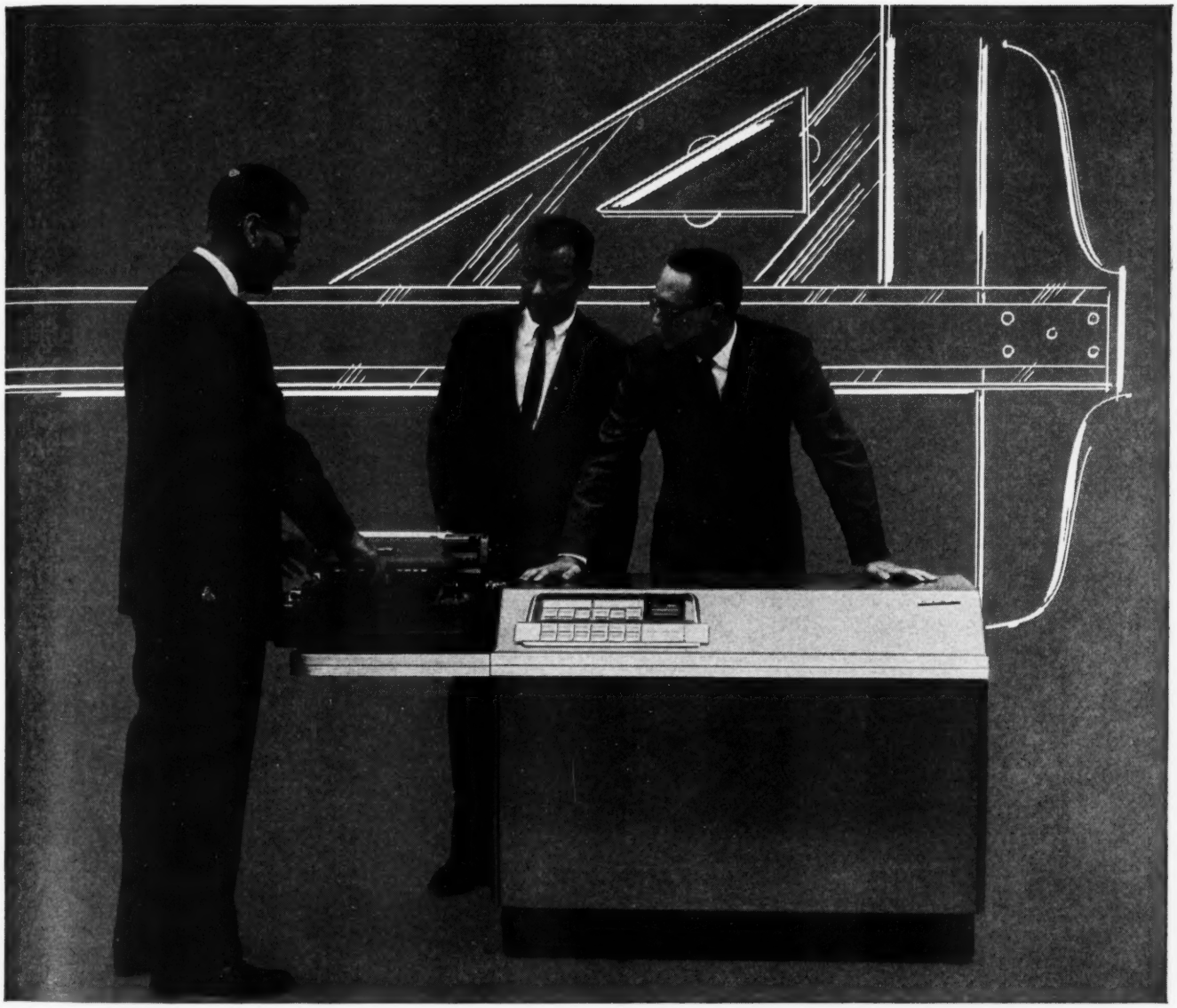
Some 20 consulting engineers and state highway officials participated in the Workshop on Highway Engineering Applications of Automatic Computers, sponsored by Battelle Memorial Institute's Systems Engineering Division.

Members of the Battelle staff, assisted by representatives of Ohio State University, Photronix, Inc.,



AT COMPUTER ARE, L. TO R.: M. WADSWORTH, GARRETT, FLEMING, CORDDRY, AND CARPENTER; J. A. TIERNEY, PARSONS, BRINCKERHOFF, HALL, AND MACDONALD; L. HURD, OHIO DEPT. OF HWYS.; C. HORNBECK, CLAIR A. HILL AND ASSOCIATES.

and the State of Ohio Highway Department, demonstrated the use of computers to solve such problems as cut-and-fill, right of way, geometrics, and pier stress analysis. ▲▲



Get greater productivity in highway design with this powerful electronic computer ROYAL PRECISION LGP-30

Large capacity... easily programmed and operated... mobile... low in cost

Here, at last, is a complete general-purpose electronic computer within the reach of every civil engineering firm. Remarkably small in size, completely mobile, LGP-30 saves time and money in the design of dams, bridges, highways . . . eliminates the tedium of routine calculation by bringing high-speed computation *right to your desk.* And at the lowest cost ever for a complete computer system!

Faster answers; unusual capacity. With speed and memory (4096 words) comparable to computers many times its size and cost, LGP-30 gives you fast, effortless answers to such problems as cut and fill, grade profile, traverse closure, field stakeout, bridge design, highway alignment. Self-cooled, LGP-30 operates from any convenient wall outlet, gives you stored-program operation for greater flexibility. (For example, highway design geometry breaks down into approximately 14 different component problems; these may all be stored in the LGP-30 and used in whatever combination is required.) Thus you save valuable time, cut costs, better your competitive position.

Easy to operate and program. LGP-30's remarkably simplified controls may be operated with only minimum computer experience. Answers are printed out directly . . . do not require deciphering. Programming is easily learned. A library of sub-routines, plus programs for a wide variety of applications, are available.

Wide range; exceptional value. The most powerful computer of its size yet developed, LGP-30 is the greatest value in today's market. Smallest initial investment ever for a complete computer . . . low operating and maintenance costs. Service available coast-to-coast.

For further information and specifications, write Royal McBee Corporation, Data Processing Equipment Division, Port Chester, N. Y.

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Men in Engineering

Peter H. Strobel and Dr. Paul I. Rongved have formed a new partnership to be known as Strobel & Rongved with offices at 70 West 40th St., New York City.

Smille & Griffin have moved to new offices at 111 Eighth Ave., New York City.

Stanley L. Krugman has been appointed Vice President of Jacobs Engineering Co., Pasadena, Calif. He was formerly chief engineer in charge of process and plant design for the chemical and petrochemical industries.

The California Council of Civil Engineers and Land Surveyors have named Bert Daniels to the new committee on apprentice training. Bill Pafford, Chuck Christensen, Lee Scott, Phil Jones, and Harold Musser are the other members of the committee. Named to a new committee for liaison with the County Engineers were Walt Hanna, Jr., Willard Walker, and Charles Coburn.

At the Annual Meeting in Boston, the Federation of Sewage and Industrial Wastes Associations elected Kenneth S. Watson, of Schenectady, N.Y., as President.

Watson, a water quality engineer for the General Electric Co., succeeds Emil C. Jensen, Seattle.

Other officers are W. D. Hatfield, Superintendent of the Decatur, Ill., sewage treatment plant, Vice President; and W. W. DeBerard, Chicago's Deputy Water Commissioner, Treasurer.

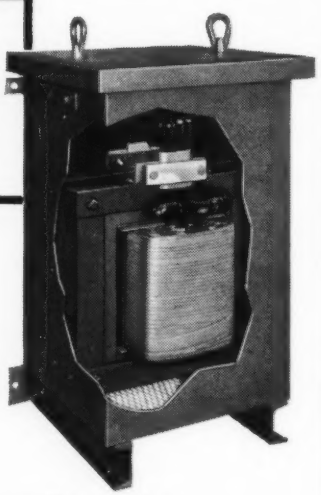
The Consulting Engineers Association of Colorado at its annual meeting elected Rhuel Anderson, Anderson and Koerwitz, President; Robert Behrens, Tracy-Behrens, Vice President; and Albert E. McKittrick, Secretary-Treasurer. Orley Phillips was named CEC Director. An alternate director will be appointed in the near future.

John A. Blume & Associates, Engineers, formerly John A. Blume, Structural Engineer, and Associates, have moved to 612 Howard Street, San Francisco, Calif. Officers of the firm are: John A. Blume, J. P. Nicoletti, D. M. Teixeira, H. J. Sexton, R. L. Sharpe, and A. I. Flaherty.

William E. Burroughs, Consulting Engineer, has opened offices in the Philadelphia Savings Fund Building, 12 South 12th St., Philadelphia, Pa. Formerly with Modjeski & Masters, Burroughs will specialize in design of long span bridges, tall buildings, plans and reports for express highways, and city improvements.

The American Society of Civil Engineers installed its new officers at the Annual Meeting in New York City. They are: Louis R. Howson, President; Waldo G. Bowman and Samuel B. Morris as Vice Presidents; Weston S. Evans, Craig P. Hazelet, Donald H. Mat-

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MOISTURE-RESISTANT COILS
Coils are vacuum pressure impregnated with polymerizing-type varnish.

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Designed for optimum copper to core loss ratio. The use of high-grade, non-ageing silicon steel assures low operating costs.

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Brackets are provided for either floor or wall mounting.

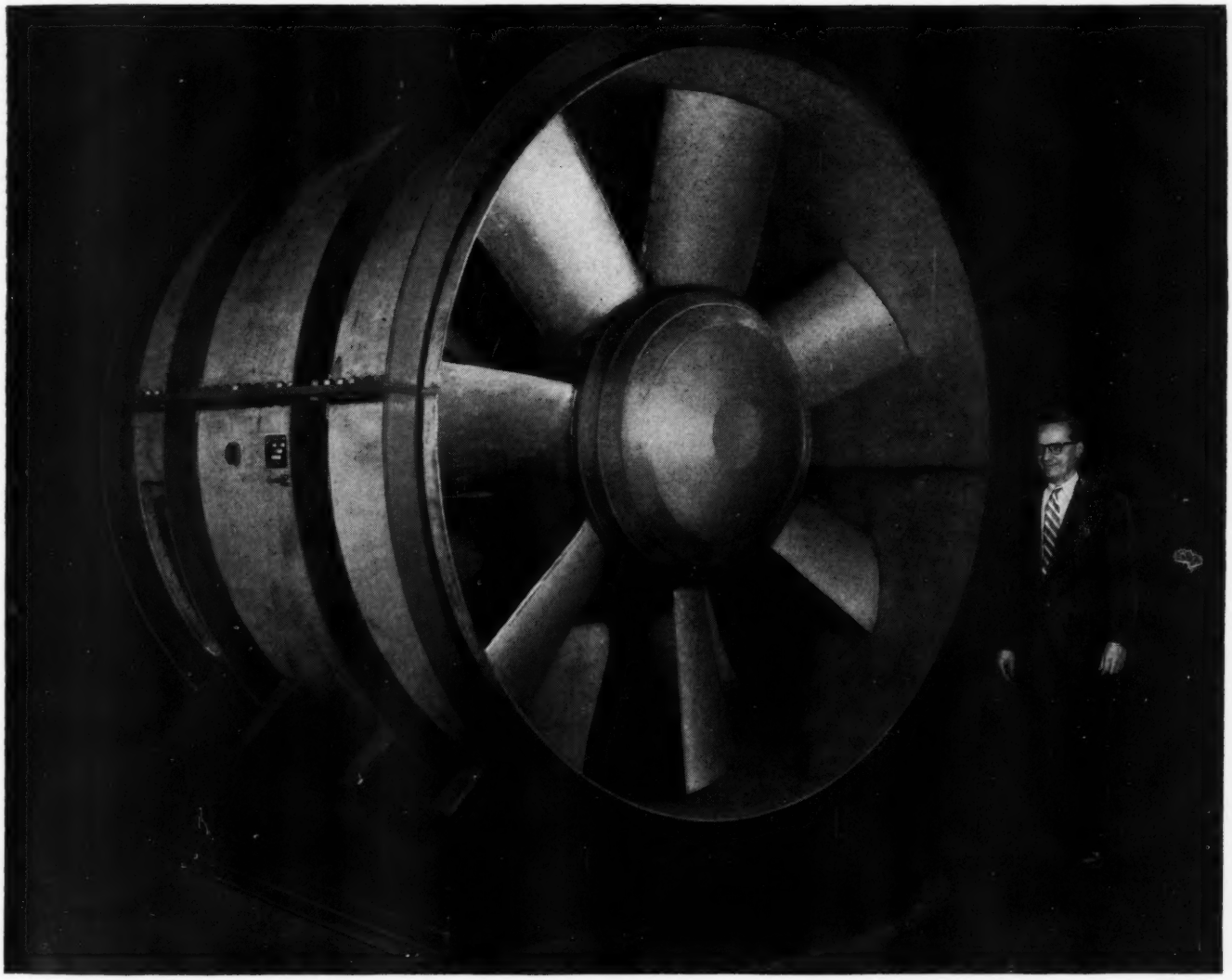
RIGID CONSTRUCTION
The core is tightly clamped between steel weldments.

EASY CONNECTIONS
A removable top cover exposes the large wiring compartment and facilitates installation. Extra long, heavily insulated terminal leads are clearly marked for identification.

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Coils are wound with double-insulated copper wire with large electrical clearance between coil and core. They are also rigidly blocked to withstand internal stresses.

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Big jobs, like the one shown above . . . or smaller jobs, like the hood exhaust at lower left . . . "Buffalo" Axial Flow Fans take them all in stride.

The demand for "Buffalo" Axials is steadily increasing, because they offer so many superior advantages. Among these are extremely high efficiencies, quiet operation, built-in rigidity of construction and compact size. Ideal for straight-line duct connections, "Buffalo" Vaneaxial Fans eliminate the swirling motion of air by means of scientifically-engineered guide vanes. This energy is thus converted into useful forward thrust.

"Buffalo" Axial Flow Fans are the perfect solution to many space problems. Duct-size, they hug walls and ceilings, conserve productive space. They are doing an outstanding job in space-saving applications ranging from exhaust and ventilation to air conditioning.

If your specifications call for axial flow fans, be sure they're "Buffalo" Axials. Contact your nearest "Buffalo" Engineering Representative, or write us today for Bulletin 3533-EF.

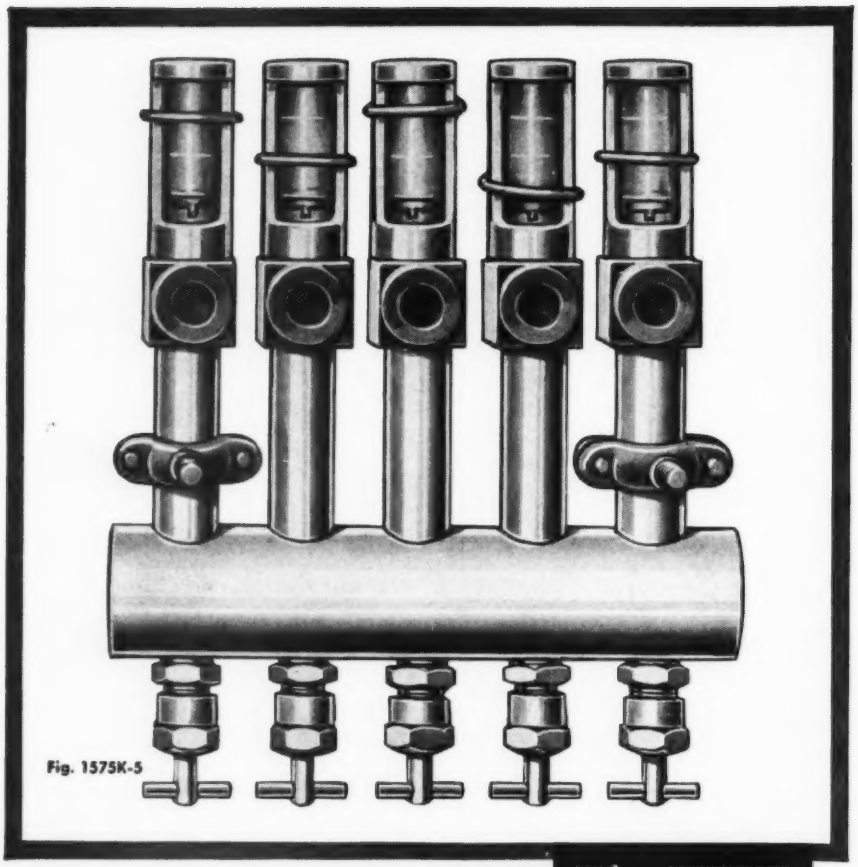


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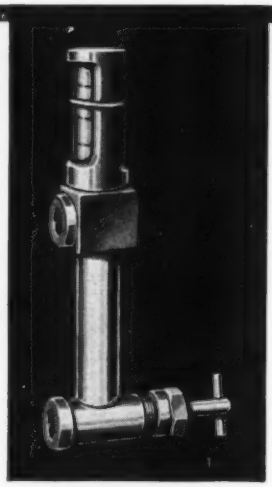


Fig. 1575

Now you can deliver lubricating oil or other liquids under pressure, in accurately measured quantities, to high or otherwise inaccessible points with the Nugent pressure sight flow lubricator. They are available as single units or in multiples to 15 depending upon the number of feeds required.

Each lubricator making up a multiple unit is capable of feeding fluid in amounts varying from several drops to two pints per minute by simple adjustment of the individual needle valves.

Single lubricators are available with 1/4" or 3/8" ips inlet and outlet. Inlet sizes of multiple units range to 3/4" ips with 1/4" or 3/8" ips outlets. All are designed for 125 psi maximum working pressure.

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tern, John E. Rinne, Philip C. Rutledge, and Tilton E. Shelburne, as directors.

Giffels & Vallet, Inc., L. Rossetti, has reorganized as a partnership under the name Giffels and Rossetti, Architects and Engineers. The principals of the firm are Raymond F. Giffels and Louis Rossetti. Senior associates are Edward X. Tuttle, Director of Development; Carl A. Giffels, Director of Engineering; Roy I. Jones, Director of Industrial Engineering; Betram Giffels, Engineering Consultant; and William D. Raush, Director of Production.



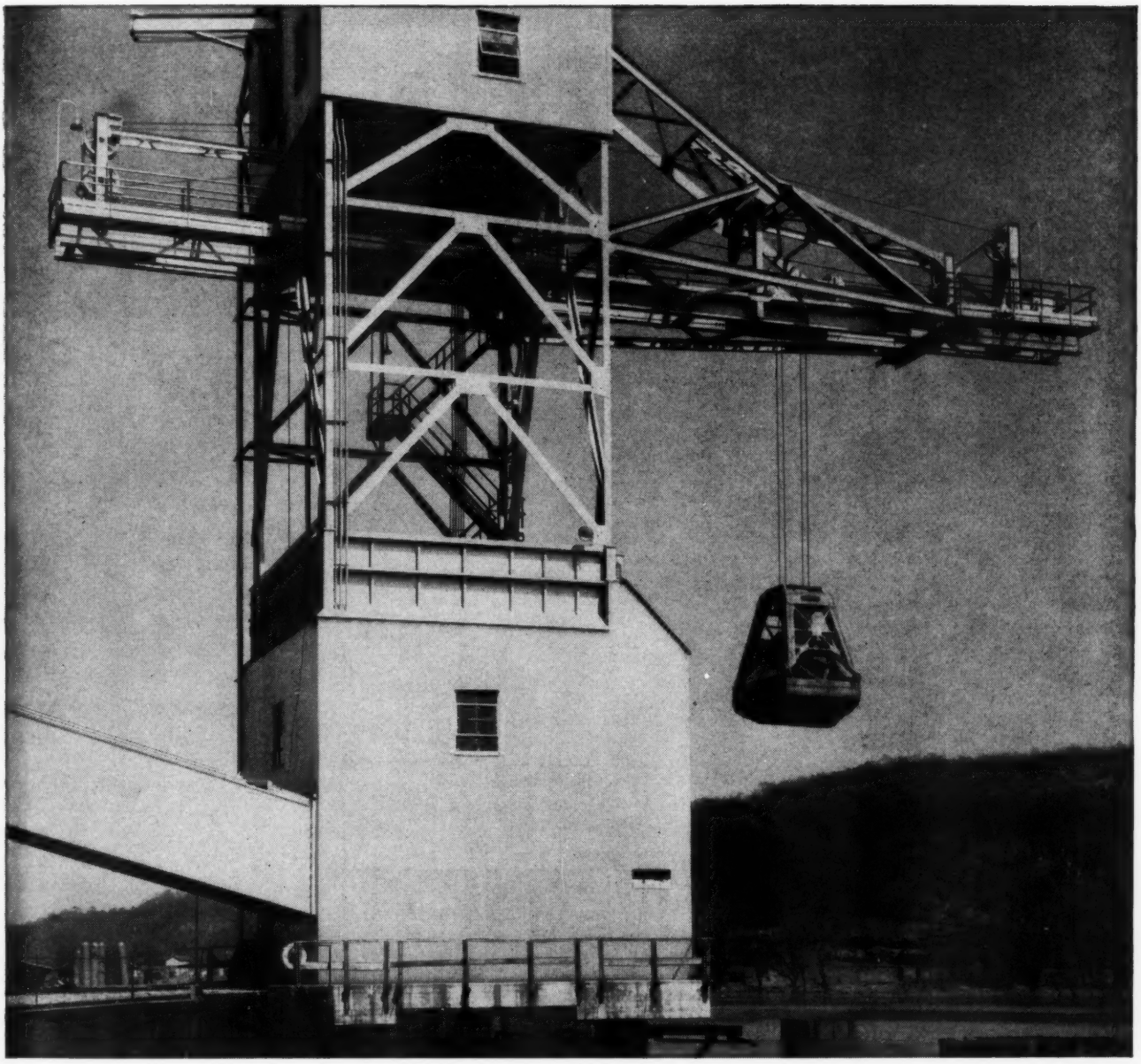
GIFFELS ROSSETTI

Giffels & Vallet, Inc., remains in being with R. F. Giffels as President. Existing commitments of the corporation will be unchanged. However, new contracts in general will be undertaken in the name of the partnership.

M. O. Chenoweth has been appointed Director of Public Relations for the American Society of Civil Engineers. For the past 14 years Chenoweth has been with Selvage & Lee, industrial public relations counsel, New York City.

The Association of Consulting Chemists and Chemical Engineers has elected Dr. Lincoln T. Work, consulting chemical engineer, New York City, as President. Vice President is Abraham Taub, consulting chemist, College of Pharmacy, New York City; Secretary is Charles Davidoff, consulting metallurgical engineer, New York City; and the Treasurer is Sam Tour, of Sam Tour & Co., Inc., New York City.

Councilors elected for three



Rope-operated coal unloader designed, built and installed by Dravo for a large generating plant on the Monongahela River

Efficient tower keeps coal unloading costs down

This Dravo rope-operated unloading tower, installed on a Dravo dock is equipped with a 7½ ton bucket. With an operating cycle of 34 seconds from barge to hopper, the tower has a free digging capacity of 800 tons per hour.

Dravo towers feature all-welded construction, a reeving system that reduces hoisting horsepower, independent, positive bucket closing and many other design advantages that mean low cost operation.

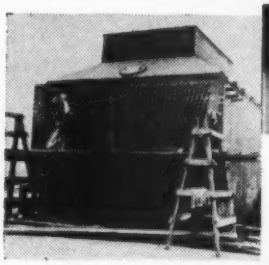
The Dravo cellular steel sheet pile dock requires no maintenance, and provides safe mooring for barges. It may support barge shifters and other auxiliary equipment as well as the unloading tower itself.

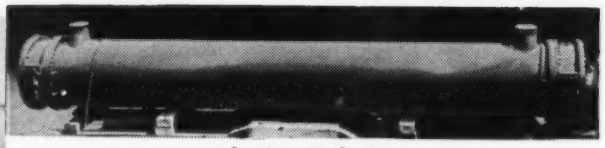
Both power companies and industrial plants have found that Dravo's more than 65 years of experience in the design, fabrication and erection of such complete facilities assures efficient and economical operation. Our engineers will be happy to discuss your client's particular problem with you, or to arrange a visit to actual installations. Simply call us at Pittsburgh, SPalding 1-1200, or write DRAVO CORPORATION, PITTSBURGH 25, PA.

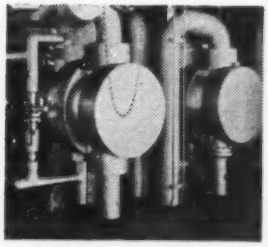
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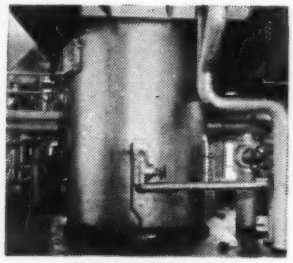
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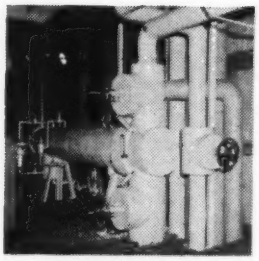
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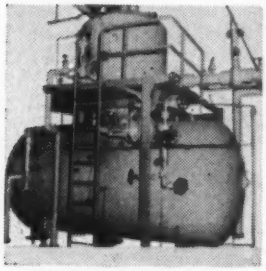

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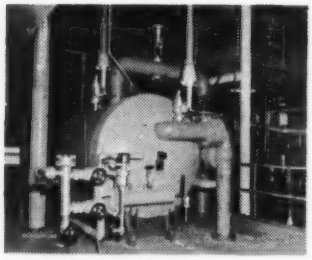

Condensate Cooler

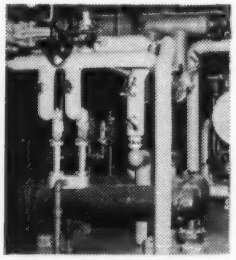

High Pressure Heaters

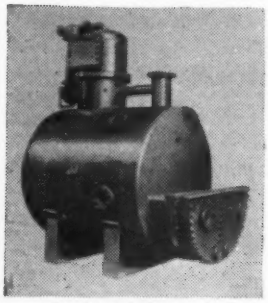

Vertical Deaerator


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Combined Evaporator & Deaerator

Condenser Service & Engineering Co., Inc., has designed, built and installed hundreds of CONDENSERS of all types; single and multi-pass; divided and non-divided flow; for engines and turbines; both power plant and water works types.

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Descriptive Bulletins Sent Promptly

year terms are: A. G. Ashcroft, Harry A. Kuhn, Irving Levenstein, David R. Schwarz, and Eugene W. K. Schwarz.

John R. Suman, former President of the American Institute of Mining, Metallurgical, and Petroleum Engineers, will be presented the John Fritz Medal at the AIME Feb. convention in New York.

Sponsored by the AIME, American Society of Civil Engineers, American Society of Mechanical Engineers, and American Institute of Electrical Engineers, the award recognizes "notable scientific or industrial achievement." Suman was a pioneer in the application of engineering principles to the development, production, and conservation of petroleum products and natural gas.

Now a consulting engineer in Houston, Texas, Suman formerly was a Vice President, Director, and executive committee member of Standard Oil Company of New Jersey.


SUMAN


ABBOUD

Alfred Abboud has been elected Vice President of Kaighin & Hughes, Inc., Toledo, Ohio. Abboud joined the firm in 1951 to organize and manage the Chemical & Refinery Division.

Charles R. Claxton, who has worked on atomic energy projects for Stone & Webster Engineering Corp. since 1954, has been made Assistant Chief Engineer of the firm's Nuclear Projects Division.

Carl L. Erb has become a Partner in the firm of Howard, Needles, Tammen & Bergendoff. He will continue as engineer in charge of the Cleveland Office. ▲▲

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BARBER COLMAN

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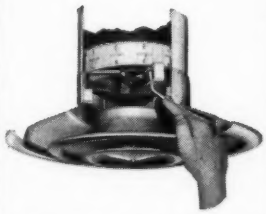
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VELOCITY-TEMPERATURE TRAVERSE THROUGH VERTICAL PLANE

A Vel.	A Temp.	B Vel.	B Temp.	C Vel.	C Temp.	D Vel.	D Temp.	E Vel.	E Temp.	F Vel.	F Temp.	G Vel.	G Temp.	H Vel.	H Temp.	I Vel.	I Temp.	
30	73.0	55	71.5	55	70.0	55	70.4	25	72.0	70	69.5	55	70	53	70	30	71.5	9'-6"
40	71.2	25	72.0	30	72.5	30	72.5	25	72.0	25	72.0	35	71.5	30	71.6	35	71.5	7'-6"
50	71.5	25	72.3	25	72.0	25	71.9	40	71.9	30	71.9	30	72.0	30	72.2	50	71.9	5'-0"
40	72.2	35	71.9	35	72.2	30	72.0	35	72.0	35	72.0	30	72.5	35	72.0	50	71.9	2'-6"
50	72.5	60	71.5	45	71.2	45	71.5	30	72.0	45	72.9	50	72.5	40	72.9	50	71.9	6"

SUPPLY AIR VOLUME — 545 CFM
SUPPLY AIR TEMPERATURE — 51.8°F
AVERAGE ROOM AIR TEMPERATURE — 72.0°F AT THE 5' LEVEL



Opposed-blade volume control is easily operated through face of diffuser.



Simple adjustment provides air patterns from horizontal to vertical.

The uniform, draft-free air distribution pattern charted above is typical of the results you can predict with Venturi-Flo ceiling diffusers. With Venturi-Flo, the mixing of primary air with room air takes place throughout the entire length of the throw. This permits even higher temperature differentials than shown in the traverse above. Barber-Colman guarantees performance of Venturi-Flo ceiling diffusers when they are used according to published data. Contact your nearby Barber-Colman field office or write for complete information. Remember . . . only Barber-Colman combines skills in both air distribution and automatic temperature controls for undivided responsibility.

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LO-BOY
CENTRIFUGAL
ROOF EXHAUSTERS

Enhance The Beauty Of Building Skylines



Pats. Pend.

Lowest Silhouette Design

FORWARD OR BACKWARD CURVE WHEEL WITHIN . . . . OR OUT OF SCROLL HOUSING

Motor mounting on side of structure support . . . out of line of air stream reduces height of Lo-Boy models nearly 50% of older designs.

LOW WIND RESISTANCE SIZES 10"-72"
600-47,000 CERTIFIED C.F.M. RATINGS

- **QUALITY**
- **BEAUTY**
- **PROVEN PERFORMANCE**

See Sweet's File 20c/Amm or Write for bulletin CE100 57

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Minneapolis 1, Minnesota

MEMBER OF THE AIR MOVING & CONDITIONING ASSN.

New Projects Reported

By Consulting Engineers

CALIFORNIA

Robert Marks
Los Angeles, California.
6th Street and Shatto Place office building. 3-story steel frame and reinforced concrete building (struc.) $700,000. Client, Ben Rabinovitch, Architect.

Hauserman Partition Co. warehouse. 1-story tilt-up concrete warehouse. (struc.) $100,000. Client, John Stahl.

Beethoven School addition. 1-story wood frame school building. (struc.) $150,000. Client, Wm. Allen, Arch.

Ponderosa Sky Ranch Inn, Paynes Creek, Calif. 1-story wood frame and concrete block hotel and restaurant. (struc.) $200,000. Client, Sidney Drasnin, Arch.

La Tijera Methodist Chapel. Glass-walled chapel of contemporary design. (struc.) $40,000. Client, Hal Whittemore, Arch.

James W. Wisda. Jr.
Los Angeles, California.
Concrete warehouse and office building. 27,000 sq ft, aluminum and glass entrance. Montebello, Calif., (civil, struc.) $250,000. Client, Metropolitan Supply Co.

Tilt-up concrete factory. 20,000 sq ft, Santa Maria stone faced aluminum and glass entrance with projecting plaster canopy. Burbank, Calif. (civil, struc.) $124,000. Client, Tech-graphic, Inc.

DISTRICT OF COLUMBIA

Penniman & Browne. Inc.
Baltimore, Maryland.
Subsurface investigations for proposed Washington Channel Bridge and adjacent interchange at Southwest Freeway, Washington, D. C. (struc.) Client, Government of the District of Columbia and Sverdrup and Parcel, Inc., St. Louis, Mo.

FLORIDA

Jas. Gamble Rogers, Lovelock & Fritz
Winter Park, Florida.
Rock Lake Elementary School, Orlando. First unit of 28-room plant to include now 16 classrooms, boiler room, and administration rooms. (civil, struc., mech., elec.) $235,000 Client, County School Board.

Simmerson and Bell
Palm Beach and Jacksonville, Fla.
Palm Beach County Industrial District. Paving, grading, and drainage ($300,000); water supply and distribution ($250,000); and sewage collection and treatment ($260,000). Client, Prospect Corp., Palm Beach.

ILLINOIS

United Engineers & Constructors, Inc.
Philadelphia, Pennsylvania.
Detailed design of boiling reactor facility to be erected in Idaho. $8,500,000 (est.) Client, Argonne National Laboratory, Lemont, Ill.

INDIANA

Fink, Roberts & Petrie
Indianapolis, Indiana
Manufacturing plant, 850 x 400 feet, with 2-story office building. $5 million. Client, Link-Belt Co.

KANSAS

Howard, Needles, Tammen & Bergendoff
Kansas City, Missouri.
Prepare final plans for 5 bridges and some culverts. Bridges include 200-ft truss span over Big Blue River and deck girder and trestle type structures. Client, Marshall County, Kansas.

MINNESOTA

L. W. Burdick, Consulting Engineer
Grand Forks, North Dakota.
8½ miles of water supply line. 1 well, 2 pumphouses, and 1 million gal concrete water reservoir. (civil) $500,000. Client, City of Warren.

NEW JERSEY

Walter Kidde Constructors, Inc.
New York, New York.
Architectural design and engineering of supporting office and laboratory facilities for Princeton University's thermonuclear Model C Stellarator research project, Princeton,

Another JERGUSON first!

Rustproofed Gages and Valves

Here's a new development from Jerguson which has tremendous significance. Through a special process, Jerguson Gages and Valves are now rustproofed inside and out. No more painting or paint chipping. No more frozen connections due to rusted threads.

Jerguson Rustproofed Gages and Valves set entirely new standards of long-life and maintenance-free service. You get a far superior job initially, and you eliminate the problems of rusting. The rustproofed surface is an ideal base for those who prefer to paint gages and valves.



Rustproofing is now standard on Jerguson Gages and Valves.

A complete line of liquid level gages, valves and specialties

Reflex and Transparent. With a variety of valves for all installations.

Large Chamber Gages. Minimize boiling and surging effect. Both Reflex and Transparent; also with non-frosting gage glass extension.

Heated and Cooled Gages and Valves. Complete line of heated and cooled gages and valves, in various models, both Reflex and Transparent.

Non-Frosting Gages. Patented design prevents frost building up over vision slot.

Welding Pad Gages. Weld right to liquid containing structure and become an integral part of it. Can be staggered for continuous visibility.

Illuminators. Explosion-proof construction, UL and CSA approved.

Group G Instrument Piping Valves. Unions, nipples, reducers, elbows, tees, valve and bleed valve all combined in one space-saving unit.

Speeded-up deliveries

We've licked delivery problems with our new, double-size plant working two full shifts. You get good delivery on any Jerguson Gage or Valve . . . and off-the-shelf delivery on many standard units.



A valuable working tool

New Catalog No. 305 gives a high-spot condensation of the facts you need in specifying and ordering. Profusely illustrated with photographs, drawings, cross-sections, tables, sizes, pressure-temperature graphs and other useful engineering data. Send today for your copy.

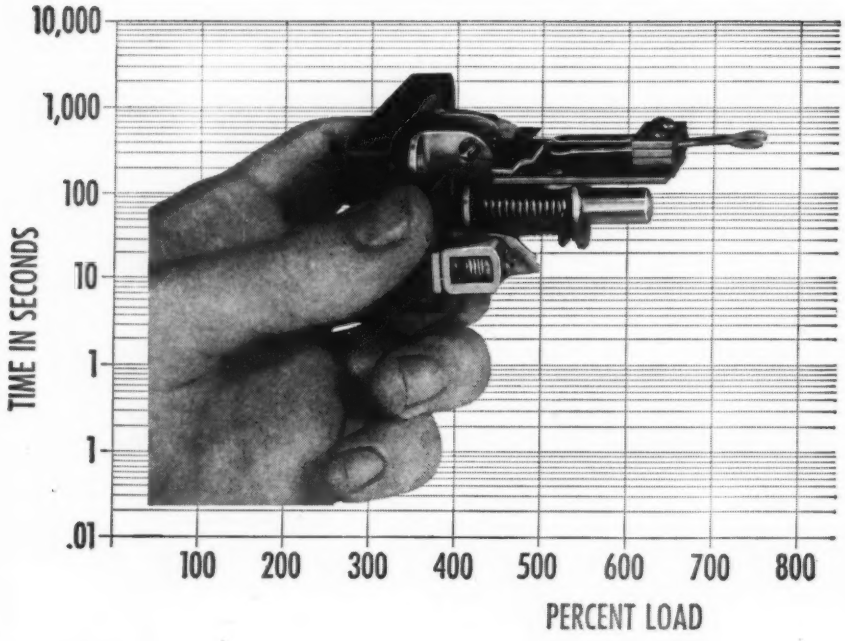
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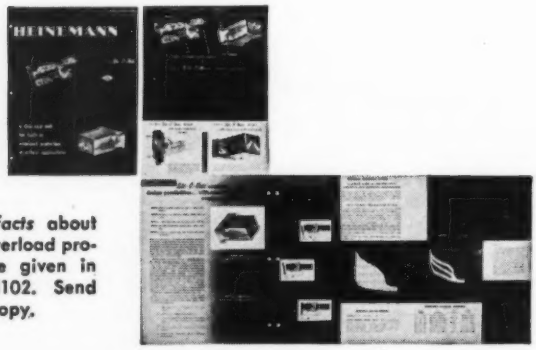
DRAW YOUR OWN CURVE
this overload relay is now tailored...to *your* equipment

NEVER BEFORE has any practical overload protector offered such close-tolerance specifications.

In most ratings, the Heinemann Silic-O-Netic Overload Relay may now be specified to trip on overloads as small as 15%. Time-delay characteristics can be selected which will permit starting inrush yet give high-speed tripping at critical load points.

Operating on the hydraulic-magnetic principle, this relay will always carry its full rated load despite ambient temperatures. It establishes a new and fully dependable close-tolerance between "must-hold" and "must-trip" current values.

Now, Silic-O-Netic Relays are available with tailored response characteristics. Within limitations, you specify the current value and the tripping time. Here is the ideal means of protection . . . an overload protector precisely rated in current and time delay to your specific equipment.



The full facts about tailored overload protection are given in Bulletin 5102. Send for your copy.

HEINEMANN
ELECTRIC COMPANY
127 Plum Street **Trenton 2, N. J.**

N.J. Client, Atomic Energy Comm.

NEW MEXICO

J. L. Breese & Associates
Santa Fe, New Mexico.
Scott office building. Heating, air conditioning, and plumbing. Farmington, N.M. (mech.) $100,000. Client, McHugh, Hooker & Bradley P. Kidder & Assoc., Arch., Santa Fe.

Tohatchi Field health center. Heating, air conditioning, and plumbing. Tohatchi, N.M. (mech.) $75,000. Client, Kenneth Clark & Philippe Register, Arch., Santa Fe, N.M.

Bridgers & Paxton
Albuquerque, New Mexico.
Student union building, University of New Mexico. (mech.) $2,500,000. Client, Meem, Holien, Buckley and Associates.

South Valley High School (1800 students), Albuquerque, N.M. (mech.) $1,300,000. Client, Ferguson-Stevens & Assoc.

Miscellaneous work for Corps of Engineers, Albuquerque, N.M. (mech.) $2,000,000 (est.) Client, several architects.

NEW YORK

Herman Kron, P.E.
New York, New York.
Gasoline service station, Brooklyn, N. Y. 1-story brick service building, 62 x 30 feet. (struc., mech., elec.) $50,000. Client, L. B. Oil Co., Inc.

Extension to present factory building, 3-story brick, 170 x 90 feet, fireproof. Brooklyn, N.Y. $200,000. Client, Dialight Corp.

Thomas M. Farmer
Syracuse, New York.
Holy Cross School, Dewitt, N.Y. Structural steel frame above first floor, precast concrete below. (struc.) $400,000 (total) Client, Pederson and Hueber, Arch., Syracuse.

Office building for Syracuse Redering Co. Wall bearing on pile foundation. (struc.) $80,000. Client, Gordon P. Schopfer, Arch., Syracuse.

Karsunky, Weller & Gooch
New York, New York.
New Hudson River Pier 40 for New York City Department of Marine and Aviation. (mech., elec.) $19,000,000. Client, Roberts & Schaeffer.

NORTH DAKOTA

L. W. Burdick, Consulting Engineer
Grand Forks, North Dakota.
24-ft diameter well superstructure.

LOW COST DIFFERENCE BETWEEN

SLIPPING FEAR



SAFETY



Pattern actual size

Eliminate slipping fear and increase efficiency by installing A.W. Super-Diamond—the low cost safety floor plate that takes the danger out of hazardous slipping areas.

Stops skids and slips *with*	Raised steel figures *diamond-shaped for maximum slip-skid resistance from all approach angles*
Get maximum wear *with*	Tough rolled steel floor plate
Easily fabricated *with*	Ordinary shop equipment
No matching problems *with*	Non-directional pattern—minimum waste
Cleans, drains rapidly *with*	No maintenance problems
Solve your slipping problem *with*	A.W. Super-Diamond as independent flooring, as an overlay—or used structurally.

For complete information write on company letterhead to Dept. **SD-S11**
No other floor plate can match A.W. Super-Diamond's safety and durability at so low a cost.



Wherever oil, grease, or other substances raise special slipping accident hazards, we suggest a check on the special non-slip qualities of A.W. ALGRIP—the world's only abrasive rolled steel safety floor plate.

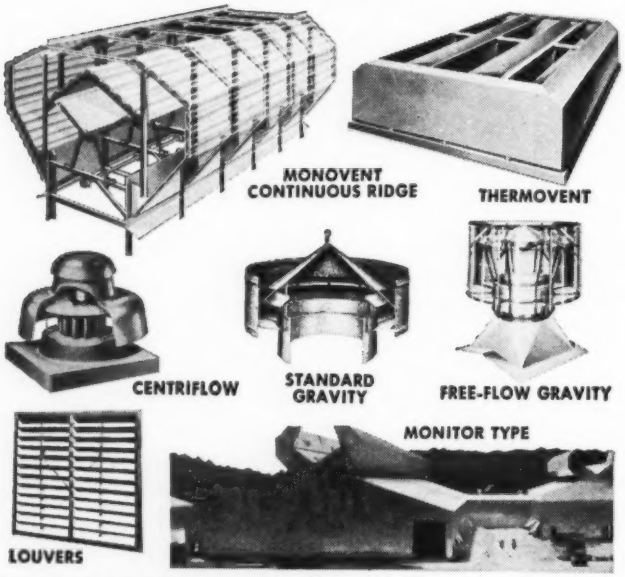
A.W. SUPER-DIAMOND
ROLLED STEEL FLOOR PLATE

ALAN WOOD STEEL COMPANY • CONSHOHOCKEN, PA.

Other Products: A.W. ALGRIP Abrasive Rolled Steel Floor Plate—Plates—Hot and Cold Rolled Sheet and Strip—(Alloy and Special Grades)



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BURT'S complete ventilator line includes a type and size to put air to work most efficiently and economically for your specialized needs. BURT'S engineering skill and know-how from more than half a century designing and building ventilators is your assurance of satisfaction. Your inquiry will receive prompt and qualified attention.



FAN & GRAVITY VENTILATORS LOUVERS • SHEET METAL SPECIALTIES

The Burt Manufacturing Company

919 S. High St., Akron 11, Ohio

MEMBER POWER FAN MANUFACTURERS ASSOCIATION

One, 1600-gpm pump and one, 1300-gpm pump and associated items. (civil) $50,000. Client, City of Jamestown.

North Central Engineers
Jamestown, North Dakota.
Sanitary sewerage system, lift station, and disposal lagoon. (civil) $70,000. Client, Hoople, N.D.

New wells, pumps, and pipeline into existing distribution system, replace some existing mains. (civil) $50,000. Client, Ellendale, N.D.

Interceptor sewer, lift stations, force main, and disposal lagoon. (civil) $75,000. Client, Hillsboro, N.D.

OHIO

William Schuller, Consulting Structural Engineer
Toledo, Ohio.
Upton Medical Building, Toledo. Clinic and pharmacy. (struc.) $100,000. Client, Richard F. Brown, Arch.

Trinity Evangelical Lutheran Church, Toledo, Ohio. Church and education building. (struc.) $196,000. Client, Hahn & Hayes, Engineers & Architects.

Croghan Bank, Fremont, Ohio. New building. (struc.) $85,000. Client, Hoke & Nickerson, Arch.

Bathhouse and swimming pool for Montpelier, Ohio. (struc.) $83,000. Client, Nelson E. Thal, Arch.

OREGON

Ray W. Preston
Oswego, Oregon.
Oregon State Correctional Institution, Salem, Ore. (elec.) $3,200,000 (total construction cost) $370,000 (elec.) Client, Annand, Bonne & Lei, Arch.

John Graham and Company
Seattle, Washington.
Lloyd Center, Portland, Ore. Regional shopping center located in downtown area. 1,200,000-sq ft rentable store area with parking area for 8600 automobiles, some double decked. Center also includes headquarters building for Bonneville Power Administration, a Sheraton Hotel, a medical building, and amusement center. $40,000,000 (store areas only). Client, Lloyd Corp.

PENNSYLVANIA

Daniel Koffler, P.E.
New Castle, Delaware.
Stenton Medical Center, Germantown, Pa. 2-story steel frame, metal skin wall, and glass panelling. (struc.) $60,000. Client, Samuel

announcing

the most durably engineered turbine type pump yet built . . .

the NEW SCHAUB POWER PLANT Boiler Feed Pump



TWO-STAGE CENTER MOUNTED
1750 RPM
CAPACITIES to 150 GPM
PRESSURES to 300 PSI

Now—Get ALL the Advantages of a Turbine Pump —WITH TWICE THE PUMP LIFE!

- Improved head range and NPSH characteristic of turbine pumps.
- Exclusive, super-hardened, triple-life impellers.
- New "over-strength" case, shafting and bearings.
- Less maintenance, easier servicing.

Exclusive
DuraHard® Electrolized Impellers

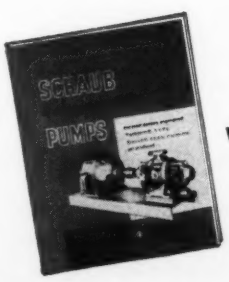
A super-hard (1100 Brinnel) "skin" of dense, non-magnetic alloy resists wear, corrosion and erosion. Will not chip, peel or spall. When, or if it eventually wears through, the base metal in its original dimension still has normal service expectancy! Electrolizing also relieves impeller of stresses set up during forming and machining . . . increases impeller life up to 300%.

Now, for the first time, you can specify or design a boiler feed system offering the advantages and better head characteristics of the turbine pump—*and get maximum pump life, too!*

The new Schaub Power Plant Pumps are "over-strength" in all components. Double-row, pre-lubricated ball bearings are oversize for a wider margin of safety. Newly improved Schaub Flexi-matic Seals permanently end packing problems, scored shafts, lubrication wash-out and seal leaks. Heavy-duty housing and bearing arms keep pumps "in line" and prevent warpage. Low stuffing box pressure doubles shaft seal life.

In short, we believe that in Schaub Power Plant Pumps you now have available to you the most trouble-free turbine pump ever built! Even its minimum maintenance needs have been made easier, quicker . . . and inexpensive.

Schaub Power Plant Pumps are one more good reason for specifying Schaub Boiler Feed Systems. *It will also pay you to specify them for individual pumps and replacements.*



WRITE FOR NEW BULLETIN No. 65 ● Get the full facts on this new major break-through in turbine pump design. Technical data, pump "lore", specifications, dimensions and capacity ratings. A must for consulting and power engineers.

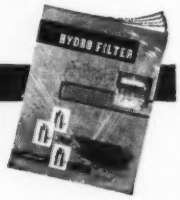
FRED H. SCHAUB ENGINEERING COMPANY
2103 S. Marshall Boulevard, Chicago 23, Illinois



Unique turbulent area assures positive dust collection at constant efficiency . . . to the micron range

Here is the "heart" of the Hydro-Filter principle of dust separation. This violently turbulent area of water, bubbles and mist is produced by the countercurrent action of air against water. Constant long contact between the air being cleaned and the water which is doing the cleaning produces a scrubbing action which is positive, thorough and unaffected by variation in volume and velocity of flow. Dust is entrained by any, or all, of three means: (1) Entrapment within falling water droplets; (2) Impingement on bubble surfaces; (3) Impingement on wetted surface of glass spheres.

As the photo indicates, the entire collection area is continually flushed. There are no dead areas to corrode or erode. No moving parts to "load up" and reduce efficiency. Maintenance is a matter of *minutes a month*. Collection of dust to micron size is continuous and sludge removal automatic with the National Hydro-Filter.



Write for Bulletin 55 . . .

See why and how separating efficiencies of up to 98.9% on foundry shakeout dust are possible practical—and continuous with Hydro-Filter!

NATIONAL

Dust Collector Corp.

606 Machinery Hall Bldg., Chicago 6, Illinois

Subsidiary of National Engineering Company, Manufacturer of Simpson Mix-Mullers.

Oshiver and Associates, Architects and Engineers.

M. J. Greene Company, Inc.
Pittsburgh, Pennsylvania.
Ore bridges, material handling structures, sintering plants, barges, mechanical products. (civil, struc., mech.) Client, Dravo Corp., Pittsburgh, Pa.

Chemical plant renovation and expansion. (mech.) Client, American Cyanamid Co., Bridgeville, Pa.

Steel mill expansion (J. & L. Steel Corp.) and power plant (St. Joseph Lead Co.) (mech.) Client, Henry J. Kaiser Co., Monaca and Aliquippa.

Buchart Engineering Corporation
York, Pennsylvania.
Garfield Elementary School. Prepare design, specifications, and structural plans. Steel structure. $500,000. Client, Buchart Associates.

Fulton National Bank. Prepare design, specifications, and structural plans. Steel structure. (struc.) $60,000. Client, Buchart Associates.

Farm show building, Harrisburg. Prepare plans and specifications for addition and alterations to existing building. (struc.) $100,000. Client, W. K. Hood Associates.

RHODE ISLAND

The Fluor Corporation
Los Angeles, California.
Mechanical design, engineering, and construction of complete 43,000 barrels-per-stream-day refinery at Jamestown, R.I. Offsite facilities include 600,000-lbs pr hr boiler plant, complete salt water cooling system, tank farm, docks for loading tankers, and other facilities. $50 million. Client, Commerce Oil Refining Corp.

TEXAS

Bridgers & Paxton
Albuquerque, New Mexico.
3-story Houston Smith office building, Odessa, Texas. (mech.) $500,000. Client, Gordon McCutchan, Arch.

VERMONT

Joseph A. Kestner, Jr., Consulting Engineer.
Troy, New York.
Treatment plant and outfall sewer. (civil) $107,700. Client, South Burlington, Vt., Fire District #4.

Lev Zetlin, Consulting Engineer.
New York, New York.
Porter Memorial Hospital, Middlebury, Vt. (struc.) $36,000. Client, Helge Westermann, Arch. ▲▲

SORGEL — the Quietest dry-type transformers at standard prices

WE GUARANTEE that the sound levels of ALL Sorgel dry-type transformers are well below the established standards in ALL ratings up to 3000 Kva, and all voltages up to 15,000 volts. This has been an outstanding feature in Sorgel transformers for many years; in fact, we are the **originators** of low sound level dry-type transformers.

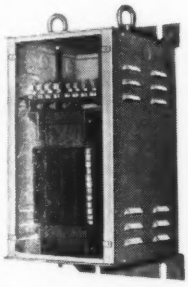
HIGHEST ENDORSEMENT. Sorgel Sound-Rated transformers have earned the highest endorsement of leading engineers and discriminating users.

OUR MODERN TESTING FACILITIES enable us to prove the low sound level, efficiency, temperature rise, and performance of Sorgel transformers, before installation.

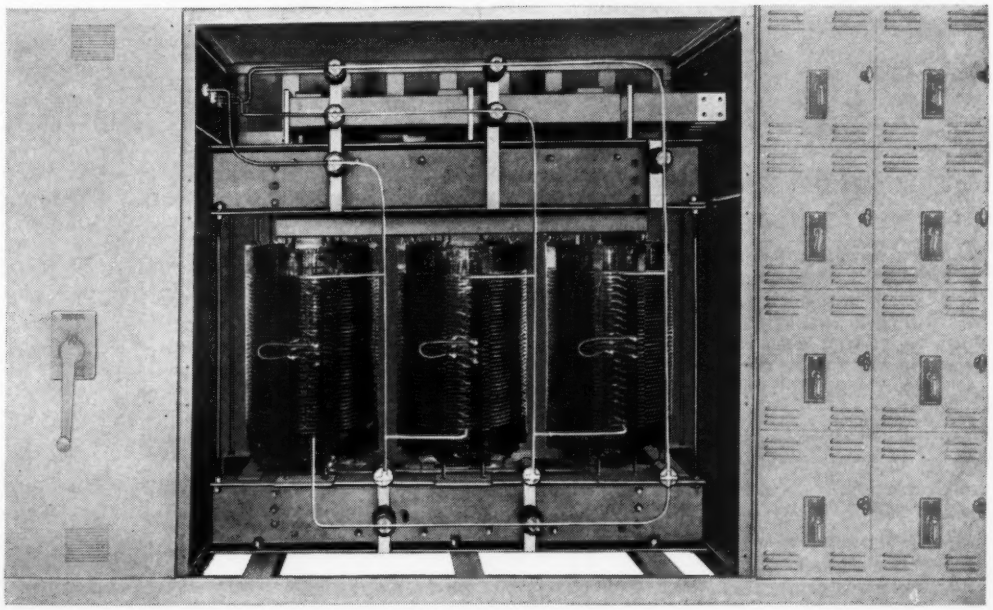
INSTALLATION SAVINGS. SORGEL dry-type transformers are so quiet that they can be installed in any convenient place inside of buldings, close to load centers. This results in shorter feeders, better voltage regulation, more efficient distribution, and lower wiring cost.

Substation Transformers

The same quiet Sorgel transformers, in ALL ratings up to 3000 Kva and up to 15,000 volts, are also incorporated in substations.



20 to 75 KVA single phase. Wall mounting. Connection compartment panel removed.



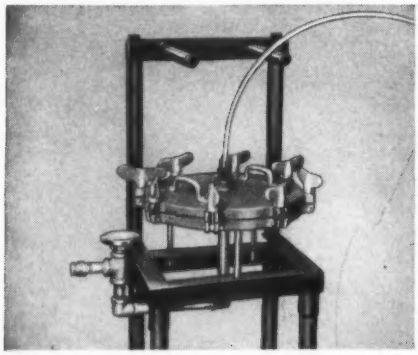
1000 Kva 13,200 volt Sorgel dry-type transforme: in a substation—Compartment panel removed

Sales engineers in principal cities.

Consult the classified section of your telephone directory or communicate with our factory.

SORGEL ELECTRIC CO., 843 West National Ave., Milwaukee 4, Wisconsin

NEW PRODUCT



BARNSTEAD "MF" SUBMICRON FILTER FOR REMOVAL OF PARTICLES TO 0.45 MICRON

This new Barnstead "MF" Submicron Filter for either distilled or demineralized water, has been developed to remove submicroscopic particulate matter which may cause trouble in some of the new processes in electronic and nucleonic fields. The Barnstead "MF" Submicron Filter will filter out particles as small as .000016 inches, thus permitting a filtering technique not before possible on a production basis.

Each Barnstead "MF" Filter plate can filter up to 100 gallons per hour. Multiple plates can be employed to obtain larger flow rates.

Write for new bulletin #141 to the Barnstead Still & Demineralizer Company, 44 Lanesville Terrace, Boston 31, Massachusetts.



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Mobile Safety Electrification for Cranes, Monorails, All Moving Machinery.

These are the only enclosed conductor systems that meet *all* requirements of mobile safety electrification. Standard catalog parts eliminate the need for special engineering. Installation is fast, maintenance easy. Investigate today!

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Rush catalog re Insul-8-Bar mobile electrification.

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Books

For the Libraries of

Consulting Engineers

MAGNETIC-AMPLIFIER CIRCUITS, by William A. Geyger; McGraw-Hill Book Co., Inc.; 394 pp.; $7.00.

Reviewed by
Loren E. Bollinger
The Ohio State University

In this second edition the author succeeds in updating the material presented in the previous edition while at the same time presenting a full account of modern trends in circuits for magnetic amplifiers. Geyger considers the considerable development in magnetic-amplifier circuits that has taken place in the five-year interval since the first edition was written. Not only have the applications been increasing in the industrial and military fields, but entirely new fundamental circuits have been developed.

Geyger has done extensive research with magnetic amplifiers. He has published many papers and has received a number of patents pertaining to magnetic-amplifier circuits. At the present time Dr. Geyger is at the Magnetics Division of the U. S. Naval Ordnance Laboratory.

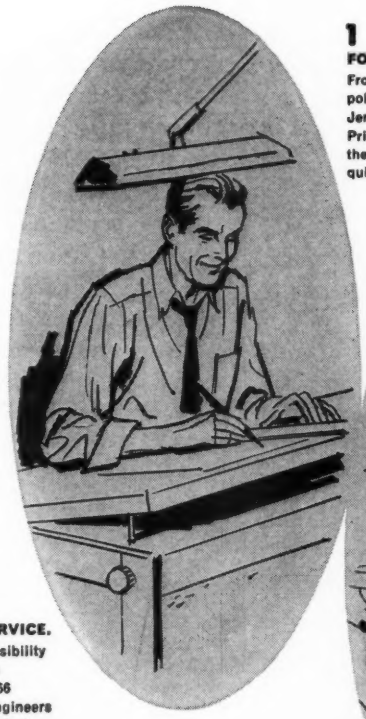
The book is written with the practical point of view in mind. Without employing extended mathematical proofs, the author discusses the fundamental principles and applications of magnetic-amplifier circuits. Graphical methods of solution are used extensively for quantitative presentation of essential facts.

At the close of each chapter a listing is given of both European and American patents together with associated technical papers. This feature is particularly valuable since many of the original contributions, especially those concerning special circuits, were written in French, German, and Swedish. Referencing of related literature is quite complete.

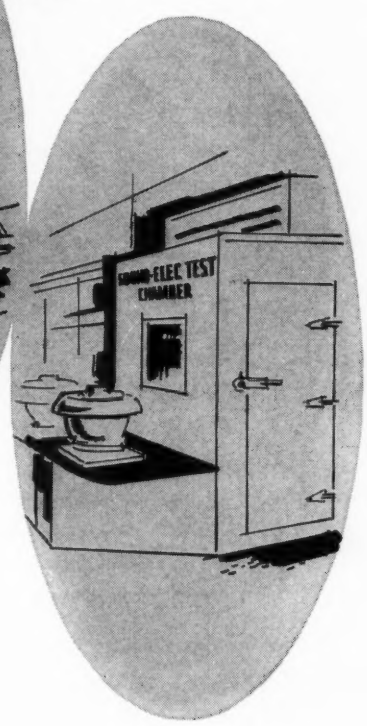
The treatment of "self-balancing" magnetic amplifiers has been expanded greatly. Consulting engineers concerned with analog-computer systems and with low-drift, high-speed magnetic servo amplifiers utilizing two-phase motor loads will find this section very interesting.

After opening with a discussion of the historical development and elementary circuits of magnetic amplifiers, Geyger presents various types of external- and internal-feedback circuits with both two and four saturable-reactor elements. Applications of magnetic circuits to flux-gate magnetometers are given in the chapter on second-harmonic-type circuits. A theoretical analysis of the transient response of high-speed, magnetic-amplifier circuits is coupled with a discussion of experimental methods of analyzing the transient response.

Many typical applications of magnetic amplifiers in the fields of instrumentation, servo systems, audio frequency amplifiers, and preamplifiers for relays are considered. Of particular interest is the application of magnetic-ampli-



1
FOLLOW THROUGH ENGINEERING.
From drafting board to final product, a single policy dictates Jenn-Air engineering: Jenn-Air exhausters must be better designed. Primary objective is—how well can we make the products? . . . not how cheaply or how quickly.



2
FOLLOW THROUGH MANUFACTURING.
Jenn-Air exhausters are constructed of ageless spun aluminum and stainless steel—motors lubricated for 10 years of normal operation. Each unit must pass final scrutiny of exacting vibronic Eye to guarantee minimum vibration—low noise level.

3
FOLLOW THROUGH SERVICE.
Jenn-Air's sense of responsibility never diminishes. Fifty-two national sales offices with 66 warehouse stocks—field engineers everywhere—provide the fastest over-night service throughout the U.S.A., the easiest-to-obtain consultation.



WHY IS JENN-AIR BETTER THAN "OR EQUAL"?

FOLLOW THROUGH ENGINEERING—MANUFACTURING—SERVICE MAKE THE BIG DIFFERENCE IN JENN-AIR POWER EXHAUSTERS

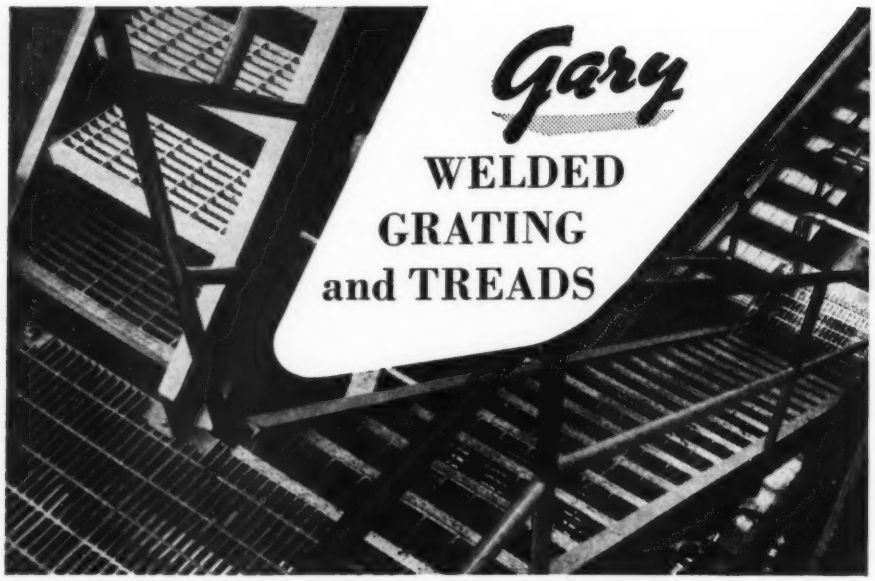
In the specification of materials or products that go into a building a commonly-used term is "or equal." Because of the principles behind Jenn-Air Quiet-Tested roof and wall exhausters, we like to believe there is *no equal* to Jenn-Air. The Jenn-Air creed demands:

Jenn-Air FOLLOW THROUGH has no "or equal."



Jenn-Air Quiet-Test Roof Exhauster, with U-Spring Cushion Suspension Mounting. Note low contour design.

JENN-AIR PRODUCTS COMPANY, INC.
1102 Stadium Drive • Indianapolis 7, Indiana



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- **TAILOR MADE**—for most economical installation.
- **RIGID STRENGTH**—sturdy resistance-welded construction.
- **LIGHT WEIGHT**—for greater load bearing capacity.
- **SELF-CLEANING**—for reduced maintenance costs.
- **OPEN CONSTRUCTION**—gives maximum ventilation and illumination.

Write For Bulletin CE-127

ROCKWELL SRA

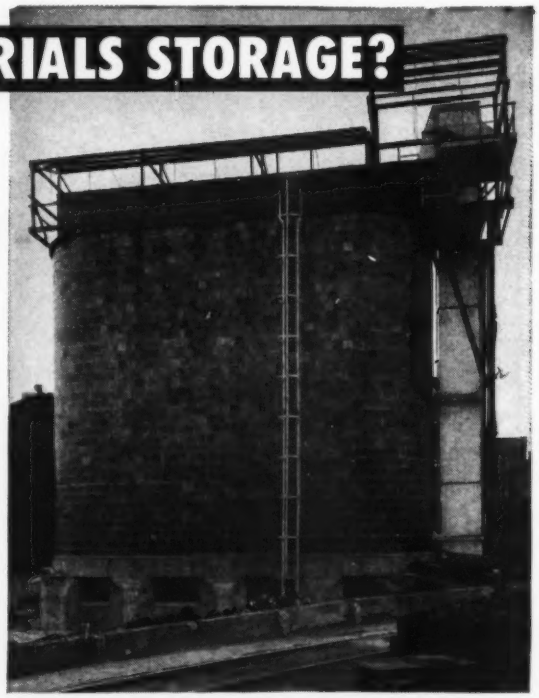
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BULK MATERIALS STORAGE?

...here's the answer to your problems...

Kalamazoo
GLAZED TILE
INDUSTRIAL STORAGE BINS

Any shape or size engineered to meet your requirements . . . heavy, monolithic construction . . . smooth-surfaced . . . weatherproof, fireproof, corrosion-proof . . . contents protected against freezing, condensation, spoilage, contamination . . . appearance that ties in with modern industrial buildings . . . . . . long-lived.



Sand handling installation at large Ohio foundry. *Kalamazoo* design and construction provides more useable space than ordinary multiple bins.

Send for complete details...

INDUSTRIAL STORAGE BIN DIVISION

Kalamazoo TANK and SILO COMPANY

fier circuits for tracing dynamic hysteresis loops. Design considerations for the use of silicon-diode, full-wave, ring modulator circuits for B-H loop tracing are covered in detail.

This book, classified according to circuit functions, gives a reasonably complete account of the subject. It is recommended to consulting engineers who desire to become acquainted with recent advances in the field of magnetic-amplifier circuits and also to those engineers who want a quick but orderly introduction to the topic.

ALSO AVAILABLE

MATERIALS HANDLING EQUIPMENT, by D. Oliphant Haynes; Chilton Book Division, 636 pp.; $17.50.

Topics covered include: basic types of equipment and their capabilities; unit-load handling; in-process handling; integration of production machinery with handling equipment; package handling; techniques for analyzing specific problems; analysis and design of handling systems; cost analysis; and organization and control of handling systems.

FILMS

"OVERLAND UNDERGROUND," Gardner-Denver Co., 16 mm, sound and color, 19 minutes.

Problems of laying a pipeline in rocky country are illustrated in this film. The pipeline in question runs between Ignacio, Colo., and Moab, Utah.

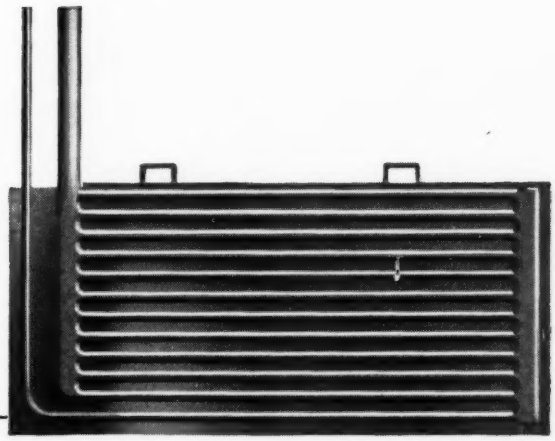
●

"HOW ZINC CONTROLS CORROSION," American Zinc Institute, sound and color, 38 min., 16 mm.

This film discusses the properties of zinc and the ways in which it protects steel and other metals from corrosion. The mechanism of corrosion is explained and methods of applying zinc coatings are illustrated. ▲▲

PLATECOIL®

The answer to your special heat transfer problems



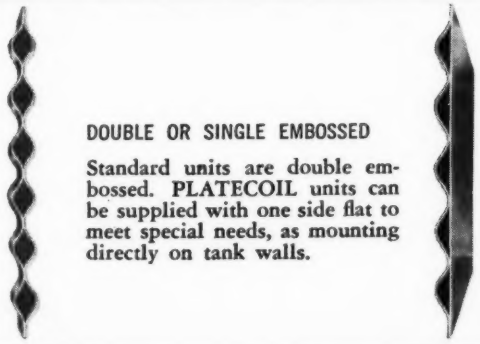
SAVES ON ENGINEERING, FABRICATING

INSTALLATION, OPERATION AND MAINTENANCE COSTS

A Tranter PLATECOIL consists of two embossed metal sheets, seam and spotwelded together to form channels for the passage of heating or cooling media. Compact, lightweight PLATECOIL units are furnished in a wide range of standard sizes and styles. PLATECOIL saves space, requiring about half the space of a pipe coil of equivalent heat transfer area. Heat transfer is accomplished fully 50% faster by PLATECOIL as compared to pipe coils.

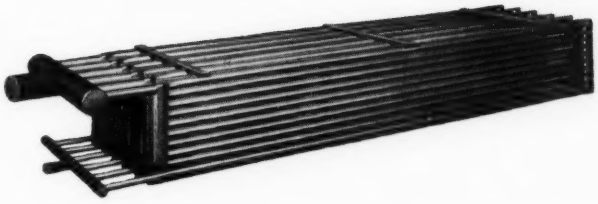
PLATECOIL Units are available in Cold Rolled Steel, Stainless Steel, Carpenter 20, Monel, and other corrosion-resistant alloys. In addition to the many sizes and styles available as standard PLATECOIL units, special units can be built on order to fit your specific requirements.

STANDARD OR SPECIAL FACTORY FABRICATED UNITS TO FIT YOUR NEEDS



DOUBLE OR SINGLE EMBOSSED

Standard units are double embossed. PLATECOIL units can be supplied with one side flat to meet special needs, as mounting directly on tank walls.



BANKED

Factory-fabricated banks of PLATECOIL are available for specific applications in heating or cooling.



ROLLED

PLATECOIL Units may be rolled to a specified diameter in the direction of width or length, in either single embossed or standard units.

WITH SURFACE FINISHES

PLATECOIL can be galvanized, metallized, electro-polished, polished for food service; prepared for plate finishes, lead and thermo-plastic coatings.

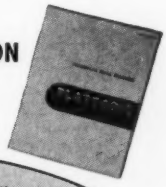
STRUCTURAL PARTS

PLATECOIL can be incorporated into heated or cooled conveyors, tank walls, baffles or partitions.

SPECIAL CONNECTIONS

Pipe connections can be supplied longer or shorter than standard, at right angles, in couplings, pipe nipples or elbows; in various positions.

COMPLETE APPLICATION INFORMATION
WRITE FOR FREE
TECHNICAL DATA MANUAL P85



Tranter Manufacturing inc.

LANSING 9, MICHIGAN

PLATECOIL® DIVISION

Consulting Engineers' Calendar

Date	Sponsor	Event	Location
Dec. 1-6	American Society of Mechanical Engineers	Annual Meeting	Statler and Sheraton-McAlpin Hotels New York, N.Y.
Dec. 4	American Institute of Consulting Engineers	Monthly Meeting	Engineers' Club New York, N.Y.
Dec. 4-5	The Asphalt Institute	Annual Meeting	Athletic Club New York, N.Y.
Dec. 4-5	The Building Research Institute	Research Correlation Conference	Shoreham Hotel Washington, D. C.
Dec. 8-11	American Institute of Chemical Engineers	Annual Meeting	Conrad Hilton Hotel Chicago, Ill.
Dec. 9-13	American Institute of Electrical Engineers	Eastern Joint Computer Conference and Exhibit	Sheraton-Park Hotel Washington, D. C.
Dec. 9-13	University of Illinois and National Association of Corrosion Engineers	Biennial Short Course on Cathodic Protection	U. of I. Campus Urbana, Ill.
Dec. 11-12	Armour Research Foundation	National Construction Industries Conference	Congress Hotel Chicago, Ill.
Jan. 6-8	American Institute of Electrical Engineers and Others	4th National Symposium	Hotel Statler Washington, D. C.
Jan. 13	American Institute of Consulting Engineers	Annual Dinner Meeting	New York, N.Y.
Jan. 14-15	Instrument Society of America	Yankee Instrument Fair & Symposium	Hotel Bradford Boston, Mass.
Jan. 20-23	American Road Builders Association	Annual Convention	Sheraton-Park Hotel Washington, D. C.
Jan. 27-29	American Society of Heating and Air-Conditioning Engineers	Annual Meeting	Penn-Sheraton Hotel Pittsburgh, Pa.
Jan. 30-31	American Society for Engineering Education	College-Industry Conference	U. of M. Campus Ann Arbor, Mich.
Feb. 3-4	Instrument Society of America	National Conference	Wilmington, Del.
Feb. 3-7	American Institute of Electrical Engineers	General Meeting	Statler and Sheraton-McAlpin Hotels New York, N.Y.
Feb. 4-6	The Society of the Plastics Industry Inc.	13th Conference	Edgewater Beach Chicago, Ill.
Feb. 10-14	American Society for Testing Materials	Committee Week	Hotel Statler St. Louis, Mo.
Feb. 14-15	National Society of Professional Engineers	National Board Meeting	Kellogg Center East Lansing, Mich.
Feb. 24-28	American Society of Civil Engineers	National Convention	Hotel Sherman Chicago, Ill.

SERVICES FOR CONSULTING ENGINEERS

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Soils Engineering — Test Borings — Load Testing — Asphalt & Concrete Design — Field and Plant Control — Steel Inspection — Mobile X-Ray
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Experience Counts: Dependable Aerial Photos and Topographic Maps for Engineering Planning and Development—Anywhere in the World!
AERO SERVICE CORPORATION
Philadelphia 20, Pa.
Oldest Flying Corporation in the World • Founded 1919

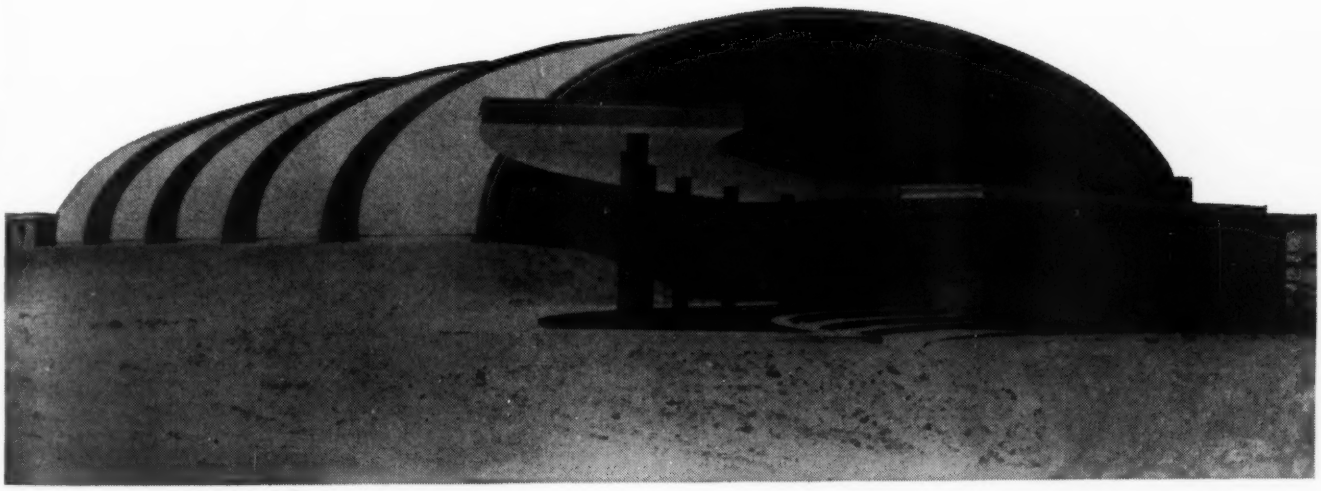
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BUILDINGS OF TOMORROW
ARE BEING WELDED TODAY—AT LOWER COSTS...



Gymnasium in Willcox, Arizona; designed by Scholer, Sakellar & Fuller, Tuscon, Arizona.

. . . because welded design is more easily adapted to dramatic new architectural concepts which combine functional beauty and economy of construction.

For example: this gymnasium which has no interior support to obstruct view or activity is made practical by the simplicity of welded design. Welded steel arch beams with tapered webs place the steel where it is needed and eliminate excess weight. Steel building panels which form the shell of the building are welded to the arch beams. This eliminates costly, time-consuming drilling and fastening.

This is just one of many examples of how consulting engineers are turning to welded design to make the architect's ideas structurally and economically possible.

ENGINEERS! ARCHITECTS!

"Studies in Structural Arc Welding" are published regularly and sent at no cost to help you with design problems. The eleventh edition of "Procedure Handbook of Arc Welding Design and Practice", 1300 pages, 1100 illustrations, has 466 page section devoted to Design for Structural Arc Welding. $3.00 postpaid in U.S.A. $3.50 elsewhere. Write.

THE LINCOLN ELECTRIC COMPANY

Dept. 5806 • Cleveland 17, Ohio

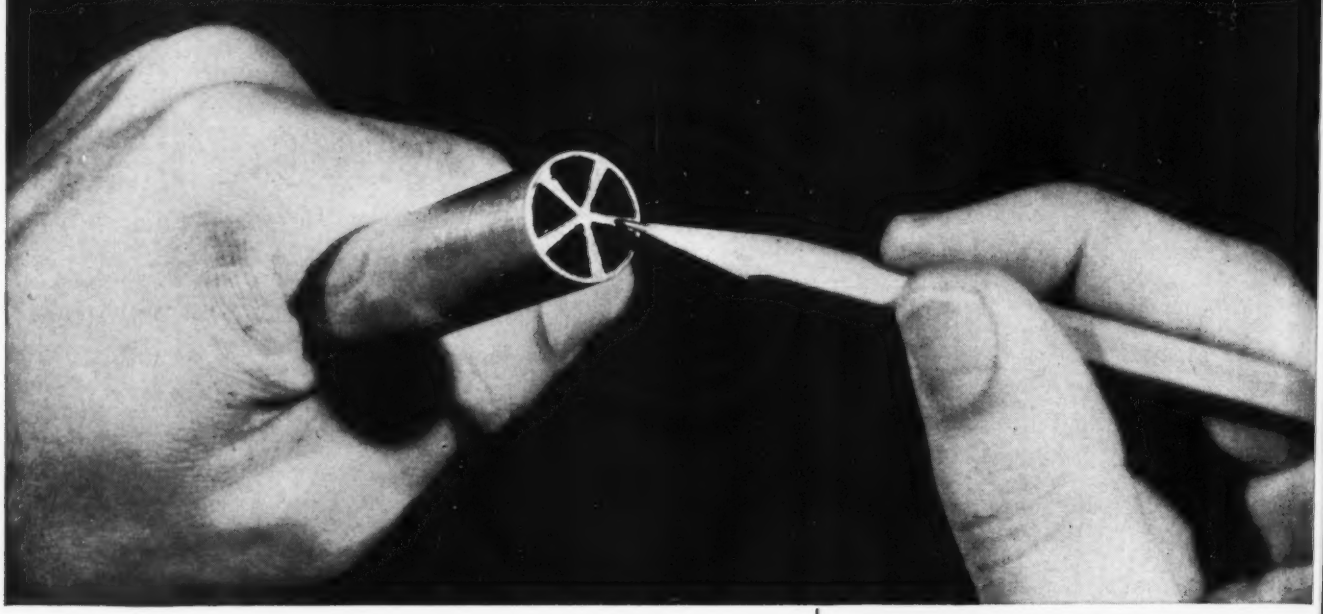
The World's Largest Manufacturer of Arc Welding Equipment

When welded design **Has** simpler construction **Yet** saves time and material

WHY aren't all your structures designed for welding?

This STAR FEATURE of the new *Acme* DRY-EX®

gives you a SMALLER, LIGHTER, MORE EFFICIENT LIQUID CHILLER



25% more cooling capacity per cubic foot

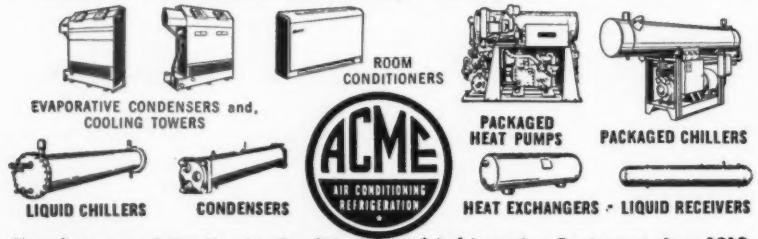
After years of research and testing, Acme announces a new and important advancement—the first real innovation in direct expansion liquid chiller design since Acme's introduction of the original Dry-Ex in 1937. A new copper tubing with a star-shaped aluminum insert* more than doubles the effective heat transfer surfaces between water and refrigerant. This makes the new Dry-Ex the first liquid chiller designed specifically for today's refrigerants. Combined with all the proved advantages of Acme's thru-tube construction, the star-insert tubing makes the new Dry-Ex smaller and lighter, with 25% more cooling capacity per cubic foot than ever before possible.

Acme's new aluminum insert provides *clear* passages for the *flow* of refrigerant so that the pressure drop is minimized. *Imbedded* in the *walls* of the tubes by a cold-drawing process, the aluminum establishes molecular contact with the copper for perfect heat conductivity.

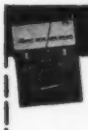
Whether it's an air conditioning or a process chilling application, the new Dry-Ex will allow you to build a more compact system — one that is economical to install and operate. Dependability is assured. The new Dry-Ex incorporates all the proven construction features that have made the Dry-Ex the leading product in its field since originated by Acme in 1937.

*Patent applied for

ACME INDUSTRIES, INC. JACKSON, MICHIGAN



Manufacturers of Quality Air Conditioning and Refrigeration Equipment since 1919



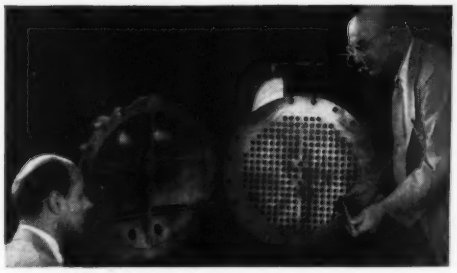
New selection procedure simplifies your engineering task

Send me the complete new catalog on Dry-Ex Liquid Chillers.

Name..... Title.....

Address.....

City..... Zone..... State.....



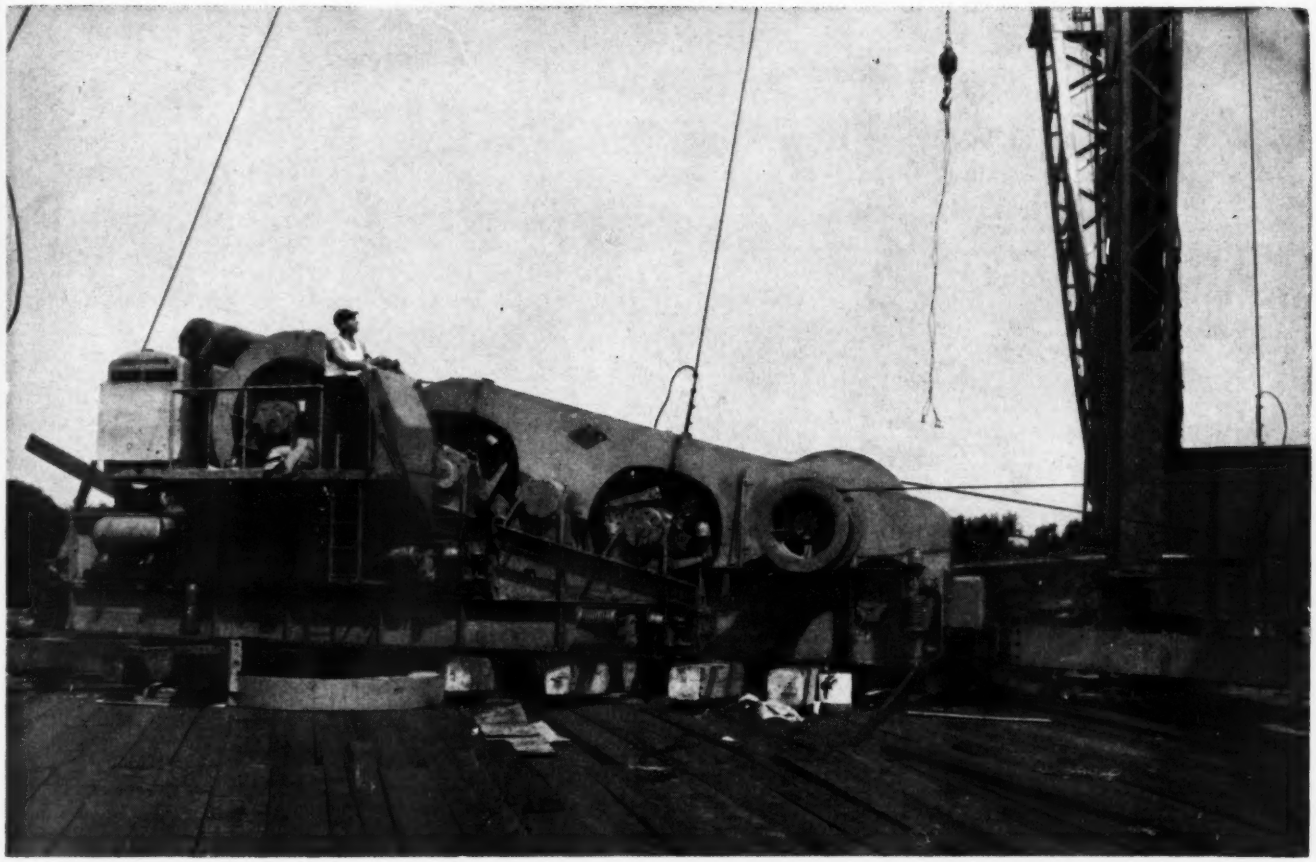
PROVEN THRU-TUBE EFFICIENCY MAINTAINED

Acme's star-shaped aluminum insert tubes of the new Dry-Ex extend straight through to multi-pass heads at each end. No bends, no *soldered* joints — no leaks! High refrigerant velocity is maintained and controlled to achieve greater chiller efficiency, lower pressure drop and more positive oil return than is possible with any other construction.

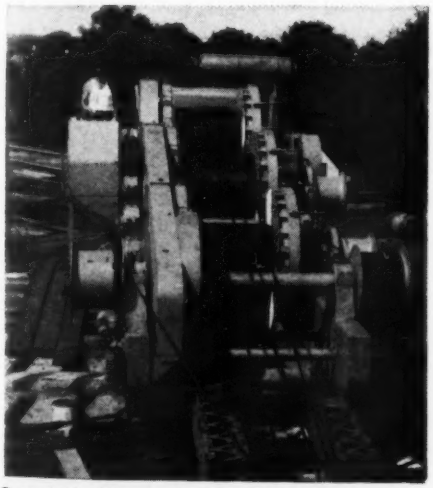


CHILLER SIZE AND WEIGHT REDUCED SIGNIFICANTLY

Diagram shows typical reduction in chiller diameter made possible by the greater heat-transfer capacity of Acme's new Dry-Ex. Because of their smaller size, these chillers fit into closer spaces, are easier for the contractor to handle and install. Reduced weight saves freight costs and smaller cubic content of refrigerant and water means a smaller refrigerant charge, less load on floors and and mounting structures.



Clyde Hoists, with 42,000 pound line pull, handle big steel in stride!



One of the Frame-12 Clyde hoists operating on the New England Turnpike. Full air controls for ease of operation, double brake bands for extra safety are but a part of the many advantages found in these better built hoists by Clyde.

During a forty-minute interval, beginning at 4:19 A.M. on two successive Sundays, two Frame-12 Clyde Hoists, handled picks of 160 tons and 250 tons on the New England Turnpike at Stamford. That was the only interval free of traffic at the railroad terminal the turnpike crosses. Girders, up to 220 feet in length, had to be placed on schedule . . . and they were with Clydes! Clydes perform jobs impossible with ordinary hoists.

An on-the-scene engineer reported there was plenty of power for simultaneous hoisting and slewing. Clyde controls permitted smooth and accurate positioning of the girders and the performance of both hoists was outstanding.

Clyde Hoists Are Available In A Complete Range of Sizes!

Whatever your hoist requirements may be, you can capitalize on Clyde's more than a half century of hoist engineering and manufacturing experience. Clyde hoists are available in a complete range of sizes from 3,000 pounds to 80,000 pounds line pull . . . hoists that give smooth, positive control with safety and dependability.

The best names in the construction field use Clyde . . . write for your bulletins and specifications on any type of Clyde equipment.

CLYDE RIC
REPUBLIC INDUSTRIAL CORPORATION

CLYDE IRON WORKS, Inc.

Established 1899
DULUTH 1, MINNESOTA

HOISTS · DERRICKS · WHIRLEYS · BUILDERS TOWERS · UNLOADERS · CAR PULLERS · ROLLERS

How many generators to



An Important Announcement

TO ASSURE YOU THAT AIR MOVING EQUIPMENT...

...will perform according to its published ratings

An international program is under way by AMCA. It will provide you as rapidly as possible with a means of identifying those types of air moving equipment qualifying under the program.

As a protection to you, practically all leading manufacturers of air moving equipment are planning to qualify their standard products in tests made in accordance with the AMCA Standard Test Code and in laboratories inspected and approved by AMCA.

Each qualifying company will operate under a license agreement with AMCA basically requiring the following:

1. **The manufacturer's laboratory must be approved by AMCA.**
2. **Qualifying equipment must be tested in accordance with the AMCA Standard Test Code and published ratings must be in accordance with such tests.**
3. **The manufacturer must maintain manufacturing control of the products involved so that the equipment will perform in accordance with published ratings.**

For more details fill in and mail the coupon below.

AIR MOVING & CONDITIONING ASSOCIATION, INC.

CUT OUT AND MAIL

AIR MOVING & CONDITIONING ASSOCIATION, INC.
2159 Guardian Bldg.
Detroit 26, Mich.

Please let me have details on the AMCA Program for rating of air moving equipment.

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$2 + 2 = 100$

Most engineers like to play with mathematics as well as work with it. And those who are most expert usually find the study of figures as fascinating as any hobby. "Multiplication by the 'Half-Double' Method" is nothing new, but dealing with problems by using a binary system instead of the usual decimal system can be entertaining. Leonard M. Majeske shows how you can go about solving problems of multiplication in a way that is highly unlikely to replace the slide rule but much more mentally stimulating. His explanation is published on page 98.

Public Hearings

With the new Federal Highway Program getting under way, and with almost every city and county in the country making plans for urban improvements, more and more engineers are being called upon to testify at public hearings. To testify effectively requires about the same abilities as those needed to do a good job as an expert witness. There are, however, some differences, and there must be a thorough understanding of the objectives of a public hearing. Mr. Lawrence S. Waterbury has had much experience in testifying at public hearings. In his article, "Your Role in the Public Hearings," on page 108, he gives a host of suggestions to engineers faced with an appearance before these minor inquisitions.

Registration in Austria

Engineers and architects in Austria now have their first national registration act — and not all of them like it. While most were in favor of some legislation to protect the position of the professional, it is now their feeling that the state has gone too far — has brought both architects and engineers pretty well under its thumb. But now it is too late to turn back. Rudolph Sobotka, our correspondent in Austria, explains the attitude of engineers and architects toward the new law in his "Report from Austria," on page 117.

East Coast West Coast

A short while back, at a meeting of engineers from all parts of the country, we received a number of compliments on our monthly "East Coast Report," "Heard Around Headquarters," and "West Coast Report." The first two are prepared by our Eastern Editor, Marjorie Oden. The "West Coast Report" is the work of Ralph Torgerson, our West Coast Correspondent. Both are doing an excellent job of keeping up with the activities of consulting engineers in their areas. And Miss Oden has done a remarkable job of collecting facts and figures on the national engineering organizations and preparing them for publication in "Heard Around Headquarters." While most of the national engineering societies have magazines of their own, their publications are seen only by their own members, and frequently the most interesting information must be read between the lines of small type telling about directors meetings and committee activities. By careful and thorough reporting, Miss Oden has been able to bring together into one column all the important society activities each month, presenting these to our readers as a sort of (forgive the words) "package deal."

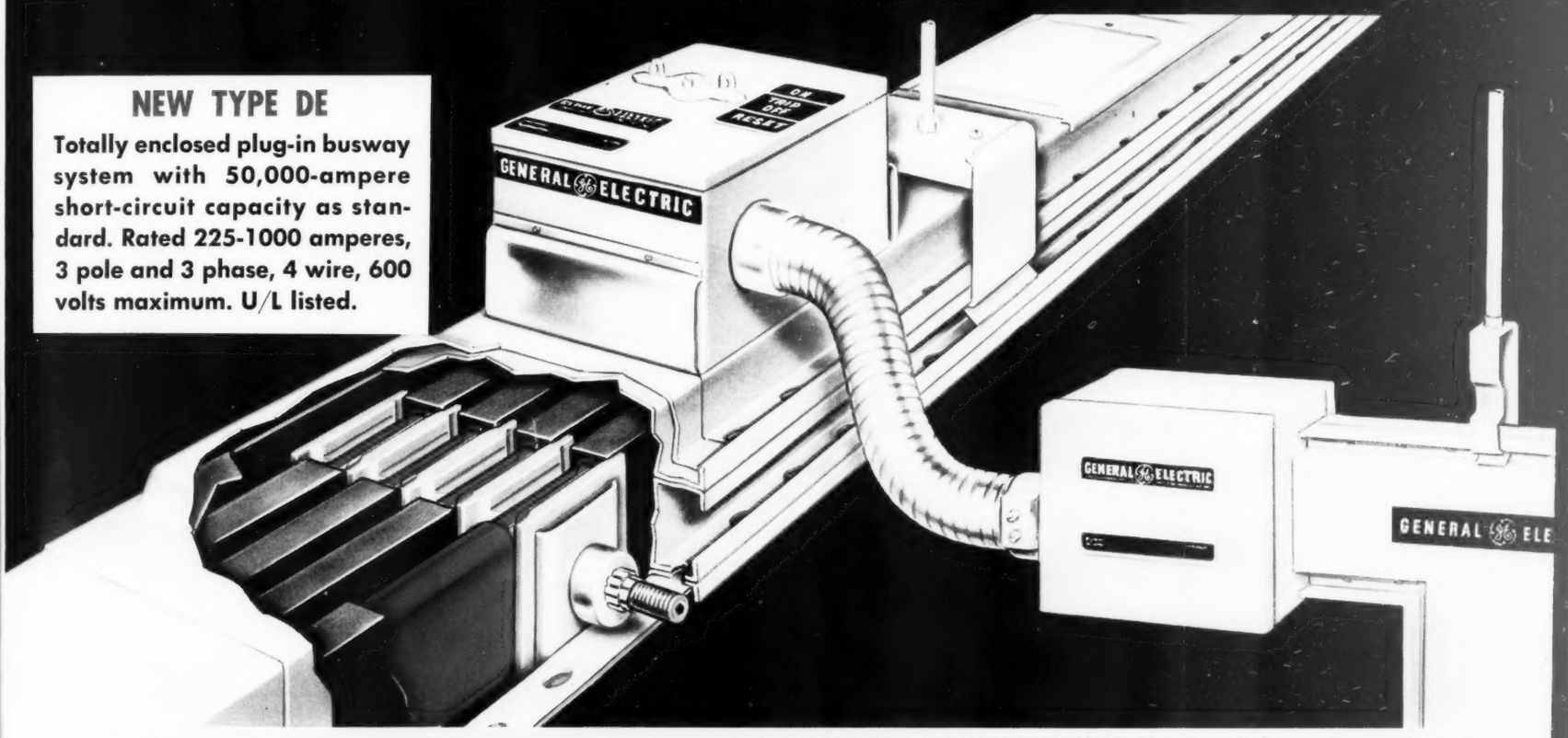
The Index

A good Index is hard to compile, difficult to print, and impossible to read. Nothing could be less important to the reader — until he needs it. Then, it is as vital as a safety pin. To take care of these emergencies, we have published again this year an annual Index of feature articles in CONSULTING ENGINEER. You will find it inserted at the back of this December issue.

Binders

This is also the time of year to bind copies of those magazines you want to keep for reference. We have had some binders made especially to fit CONSULTING ENGINEER. They cost $4.50 for a binder and a slip case designed to hold six copies. It would cost you $9.00 for a pair that would handle a full year of the magazine.

2 NEW SYSTEMS—AMPERE FOR AMPE
LIGHTEST, MOST EFFICIENT AND RUGGE



NEW TYPE DE

Totally enclosed plug-in busway system with 50,000-ampere short-circuit capacity as standard. Rated 225-1000 amperes, 3 pole and 3 phase, 4 wire, 600 volts maximum. U/L listed.

WHY ALUMINUM? **In a recent study among contractors, consulting engineers and users three outstanding advantages of aluminum in** **way were reported over and over: lower cost, lighter weight, availability.**

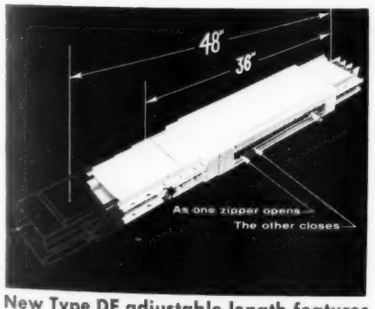
et forecasts show that the use of aluminum will increase by 70% within three ***and by 1962 will account for two-thirds of all busway manufactured.*** **In the words ny engineers and contractors: "The market is logically shifting to aluminum."**

new Type DE and DH busway offer these advantages of aluminum—plus entirely dvances in fundamental busway design. (See reverse side for full summary.)

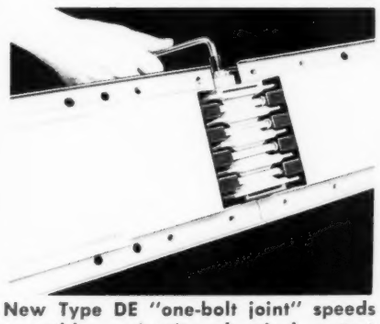
TYPE DE BUSWAY. This new light-weight, small-size busway r sents the first *major advance* in plug-in busway design in 15 years.

Its principal use is as a plug-in system in industrial plants and mercial buildings—and to these applications it brings advantage fered by no other busway.

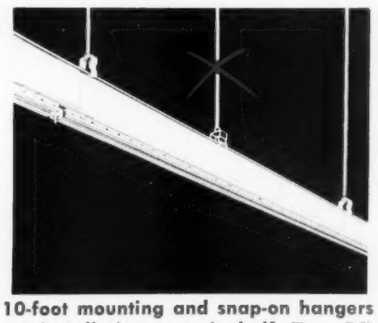
Type DE is up to 50% lighter and 30% smaller than other bu of comparable rating. It can save up to 50% in installation cost 10% over-all. It virtually eliminates need for custom engineering offers the lowest voltage drop available. In short, it incorporates of the major features that engineers, contractors and users say ar portant in busway design. That's why it has been described as busway that has everything."



New Type DE adjustable length features unique zipper closure for built-in safety. New telescoping length adjusts between 36 and 48 inches . . . eliminates need for exacting layouts. Tandem zipper arrangement seals off opening to live parts for greater safety. As one zipper opens ahead of sliding handle, the other closes behind it.



New Type DE "one-bolt joint" speeds assembly, maintains electrical contact with ton of force. Single, vise-like bolt, tightened with every-day wrench, exerts as much as a ton of force on overlapping conductors to make positive electrical contact at each joint. Twin joint cover plates provide sturdy mechanical joint connection.

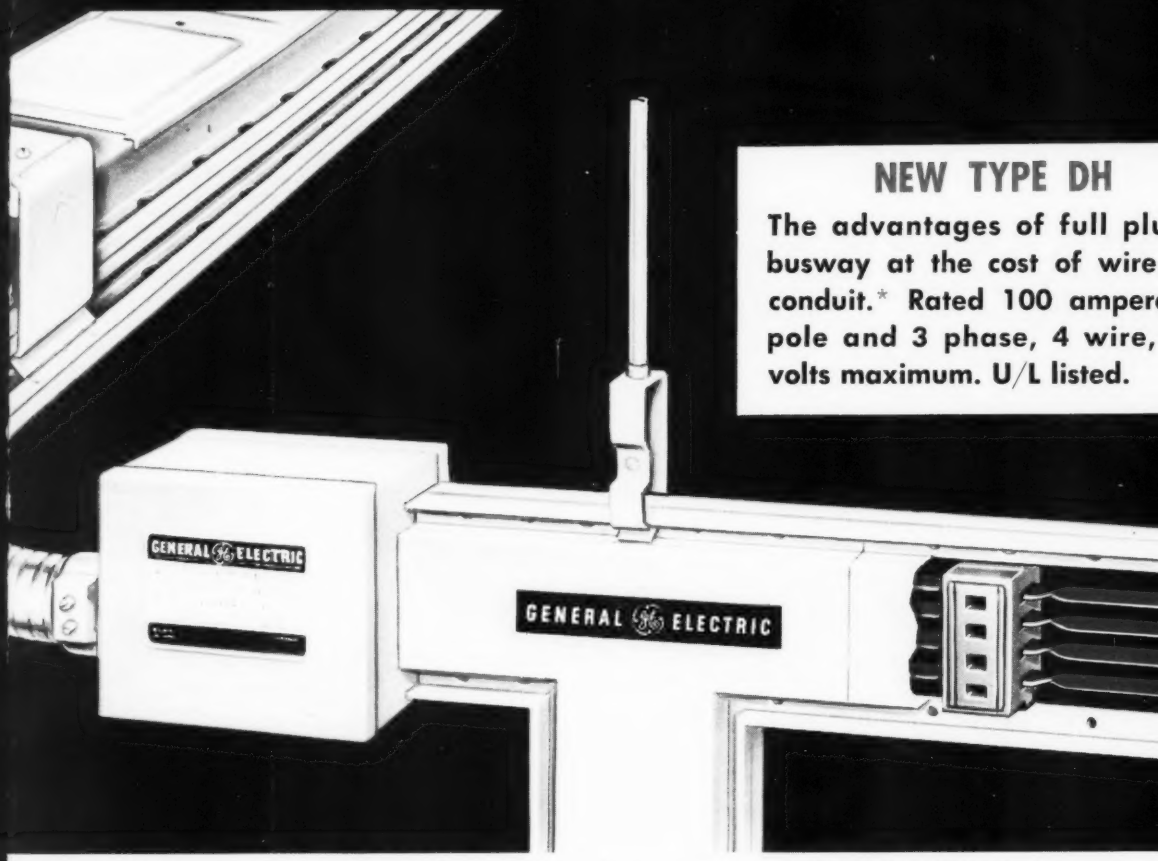


10-foot mounting and snap-on hangers cut installation costs in half. Type DE busway's light weight and rugged construction permit hanger suspension at 10-foot intervals (instead of usual five) in *any* position under virtually *any* conditions. This unique advantage, plus snap-on hangers, reduces installation costs as much as 50%.



New G-E Type DH busway may be mounted on 10-foot centers — installs quickly, easily. Underwriters' Laboratories, Inc. lists Type DH busway for suspension on 10-foot centers if it is mounted in the edgewise position. Mechanical and electrical joint connections are made by simply tightening six captive screws.

PERE FOR AMPERE, THE S
NT AND RUGGED EVER D



NEW TYPE DH

The advantages of full plu busway at the cost of wire conduit.* Rated 100 amper pole and 3 phase, 4 wire, volts maximum. U/L listed.

PE DE BUSWAY. This new light-weight, small-size busway repre- nts the first *major advance* in plug-in busway design in 15 years. Its principal use is as a plug-in system in industrial plants and com- ercial buildings—and to these applications it brings advantages of- red by no other busway.

Type DE is up to 50% lighter and 30% smaller than other busway comparable rating. It can save up to 50% in installation costs and % over-all. It virtually eliminates need for custom engineering and ers the lowest voltage drop available. In short, it incorporates *all* 22 the major features that engineers, contractors and users say are im- rtant in busway design. That's why it has been described as "the sway that has everything."

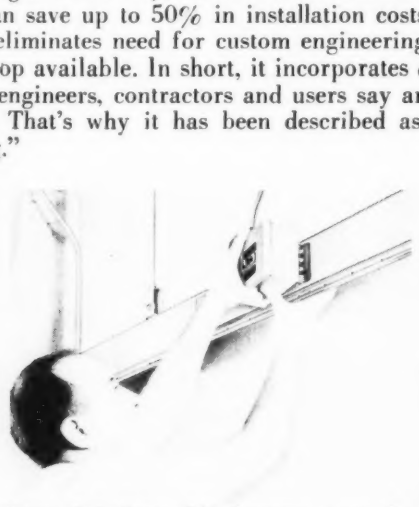
TYPE DH BUSWAY. *"'With Typ a conduit and wire job when ther tem,"* said one of the leading elec ware, after a field test of new Ty with conduit and wire systems on

Type DH busway serves as ei equally at home in the large indus in the commercial skyscraper or indoor place where small blocks

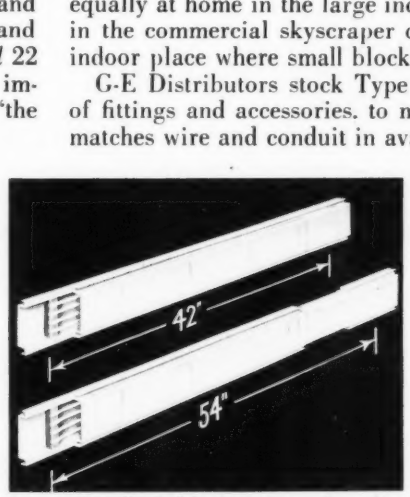
G-E Distributors stock Type D of fittings and accessories. to mee matches wire and conduit in avail



ng and snap-on hangers costs in half. Type DE eight and rugged construc- er suspension at 10-foot in- f usual five) in *any* posi- ally *any* conditions. This , plus snap-on hangers, re- costs as much as 50%.



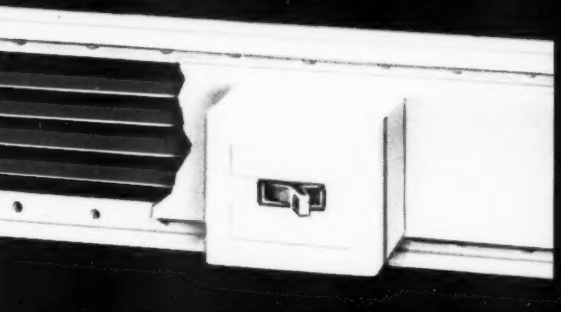
New G-E Type DH busway may be mounted on 10-foot centers — installs quickly, easily. Underwriters' Laboratories, Inc. lists Type DH busway for suspension on 10-foot centers if it is mounted in the edgewise position. Mechanical and electrical joint connections are made by simply tightening six captive screws.



Type DH adjustable length and variety of fittings add flexibility. Telescoping length adjusts between 42 and 54 inches. This, plus flexible fittings, eliminates need for exact measurement. Rigid fittings — elbows, tees and crosses — adapt busway to virtually any building contour. Lengths can be easily removed from run.

SMALLEST, DESIGNED!

DH
ull plug-in
f wire and
amperes, 3
wire, 600
sted.



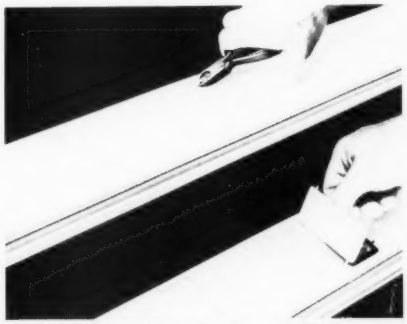
ith Type DH I can save 25% on the cost of
hen there are four or more tap-offs on the sys-
ing electrical contractors in Wilmington, Dela-
new Type DH. Type DH is *fully competitive*
tems on a total installed cost basis!

es as either a feeder or plug-in system. It's
ge industrial plant or the small machine shop,
aper or the school laboratory—in almost any
blocks of power are desirable.

Type DH busway, including its wide variety
. to meet almost any job requirement. It thus
in availability.



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s need
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way to
hs can



Straight lengths of Type DH busway provide up to 18 outlets each. Outlets are arranged in pairs, back-to-back on busway. Nine of 18 outlets on 10-foot length may be used at same time. Outlet covers are quickly and easily removed with pair of pliers. Even after removal of covers, plug outlets are dead front for greater safety.

To be stocked
by your G-E Distributor

THE FIRST BUSWAY DESIGNED SPECIFICALLY AND EXCLUSIVELY FOR ALUMINUM

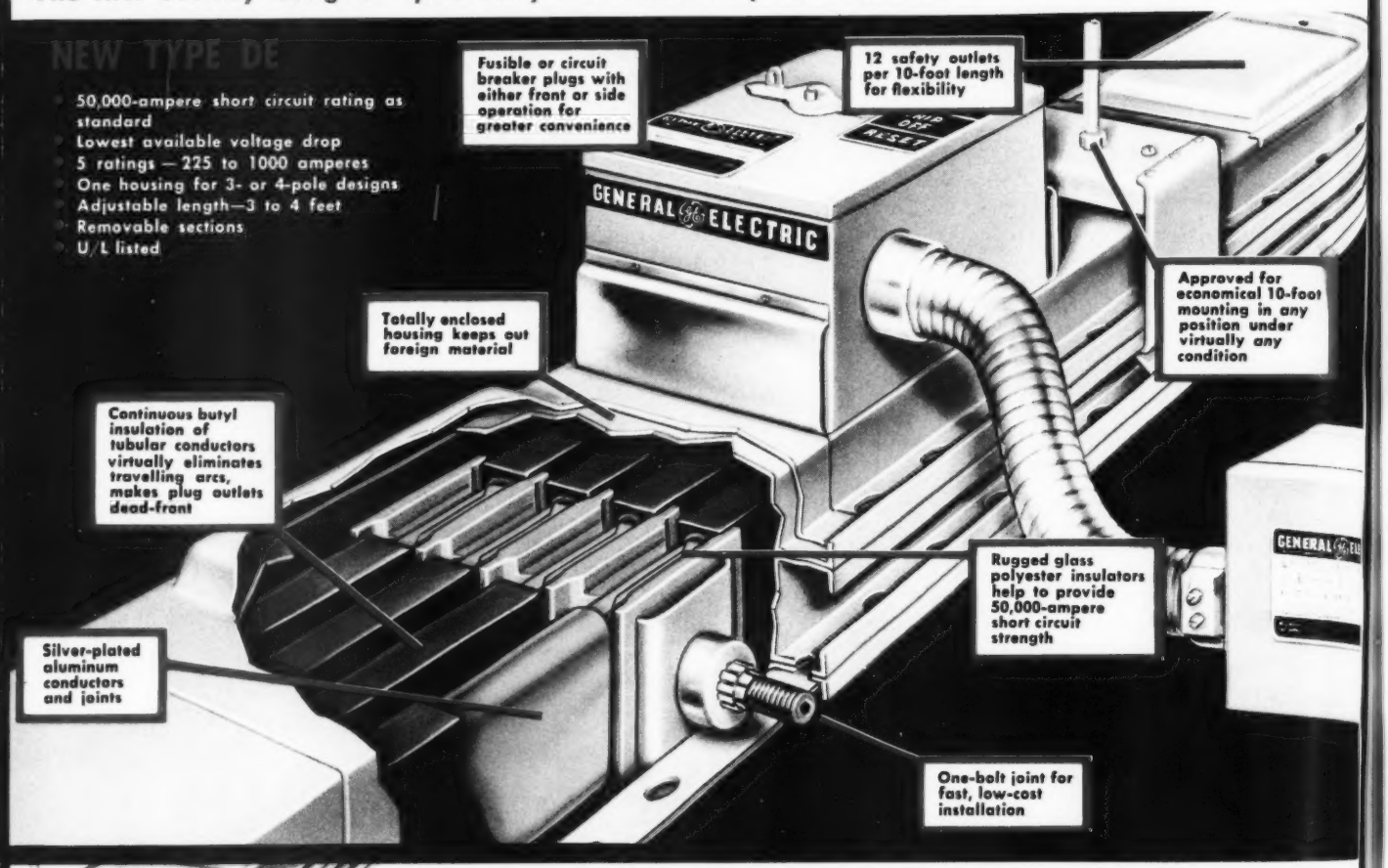
GENERAL ELECTRIC

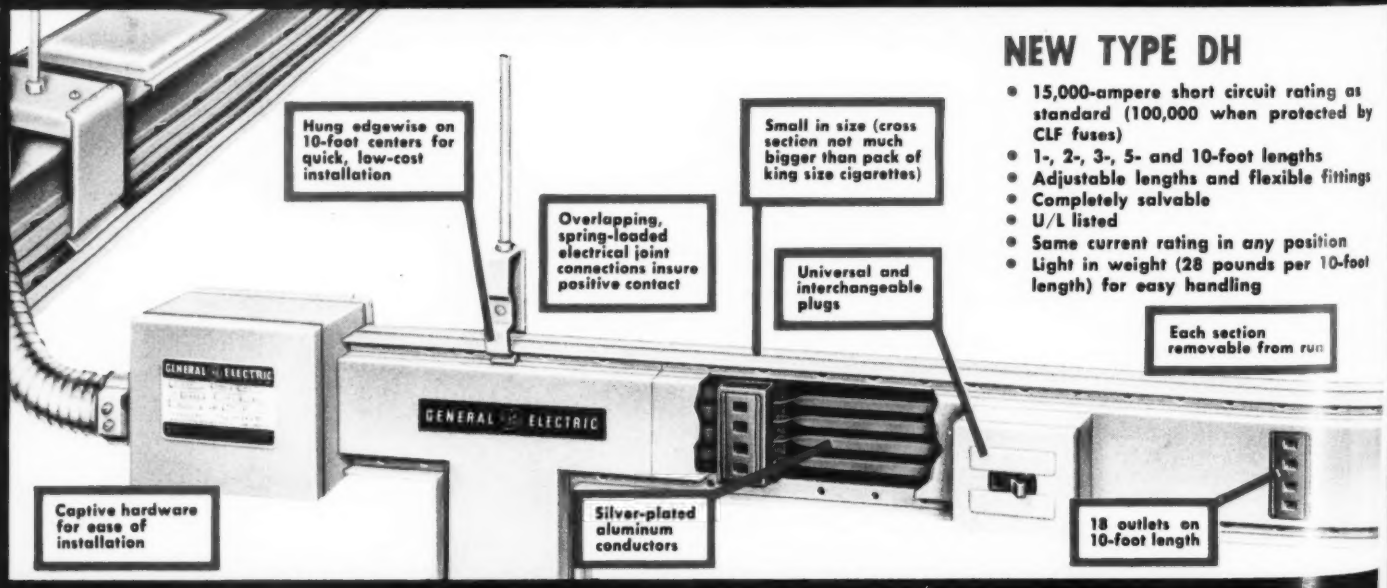
NEW GENERAL ELECTRIC TYPE DE AND DH BUSWAY

The first busway designed specifically and exclusively for aluminum

NEW TYPE DE

- 50,000-ampere short circuit rating as standard
- Lowest available voltage drop
- 5 ratings — 225 to 1000 amperes
- One housing for 3- or 4-pole designs
- Adjustable length—3 to 4 feet
- Removable sections
- U/L listed





NEW TYPE DH

- 15,000-ampere short circuit rating as standard (100,000 when protected by CLF fuses)
- 1-, 2-, 3-, 5- and 10-foot lengths
- Adjustable lengths and flexible fittings
- Completely salvable
- U/L listed
- Same current rating in *any* position
- Light in weight (28 pounds per 10-foot length) for easy handling

Type DE busway is described in Bulletin GEA-6173 and Type DH busway in Bulletin GEA-6172. For copies of these bulletins, see your nearest General Electric distributor or sales representative. Or write to **Distribution Assemblies Department, General Electric, Plainville, Conn.**

Progress Is Our Most Important Product

GENERAL ELECTRIC

WHY LET YOUR FUEL DOLLARS GO UP IN SMOKE?



Packaged Ljungstrom® Preheaters increase efficiency for boilers as small as 25,000 lbs per hour! Money spent on fuel in a single year often equals the cost of the boiler itself! And with fuel prices continually rising, every BTU is doubly precious.

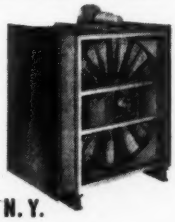
So don't let fuel dollars go up the stack—in smoke. Whether your boiler produces 25,000 or 250,000 pounds of steam per hour, the shop-assembled Ljungstrom preheater recovers heat—and dollars. Results: FUEL CONSUMPTION IS REDUCED! Generally 10% or more. This will usually write off the cost of a Ljungstrom in less than 2 years.

BOILER PRODUCTION IS INCREASED! By preheating air, higher temperatures in the furnace are assured, higher heat absorption and steam producing capacity are made possible.

LESS MAINTENANCE NEEDED! Improved combustion means less slag, cleaner stack gases. Thus you benefit from fewer overhauls; longer service between shutdowns.

LOW GRADE FUELS PRACTICAL! Higher furnace temperatures permit effective burning of very low grade fuels.

COMES READY TO INSTALL! The Ljungstrom is shop-assembled, is easily applied to your steam-generating units. For details, contact The Air Preheater Corporation today. Ask for our free brochure.



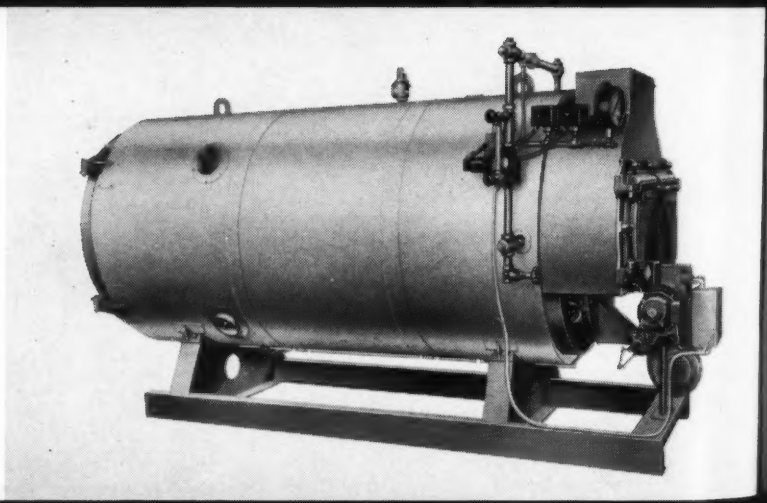
The Air Preheater Corporation, 60 EAST 42ND STREET, NEW YORK 17, N. Y.

NEW!

18 TO 92 HORSEPOWER

FORCED-DRAFT

NEW 606,000 TO 3,060,000 BTUH CAPACITIES: Forced-draft package teams low pressure Kewanee Scottie Jr. Boiler with Iron-Fireman Micro-Mist Oil Burner. Exclusive burner principle completely atomizes and carburets No. 5 or lighter fuel oil before combustion.



KEWANEE®-IRON FIREMAN

Now . . . 8 popular sizes are available in both high pressure and low pressure models.

Forced-draft firing keeps combustion air supply constant, regardless of location or atmospher conditions. Vent pipe only is needed—eliminating added cost and unsightliness of a stack.

Fuel flexibility is offered by proved burners built on exclusive principles to completely carbur either light or heavy oils. Gas and gas-oil combination units are also available.

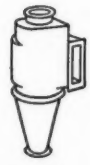
Kewanee factory-assembles the entire unit before shipping. Boiler is fitted with burner and controls factory. Fire-tested if desired. Package is shipped complete—or if job conditions require, th burner may be field mounted at a later date.

The coupon at right brings complete information. Mail it today to your nearby Kewanee Man, or t

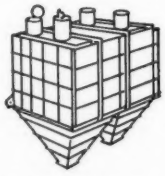
AMERICAN-STANDARD, KEWANEE BOILER DIVISION, 101 Franklin Street, Kewanee, Illinois.



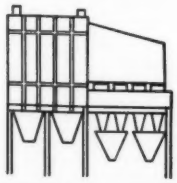
Pay dirt!
...year after year!



BUELL CYCLONE



"SF" ELECTRIC PRECIPITATOR



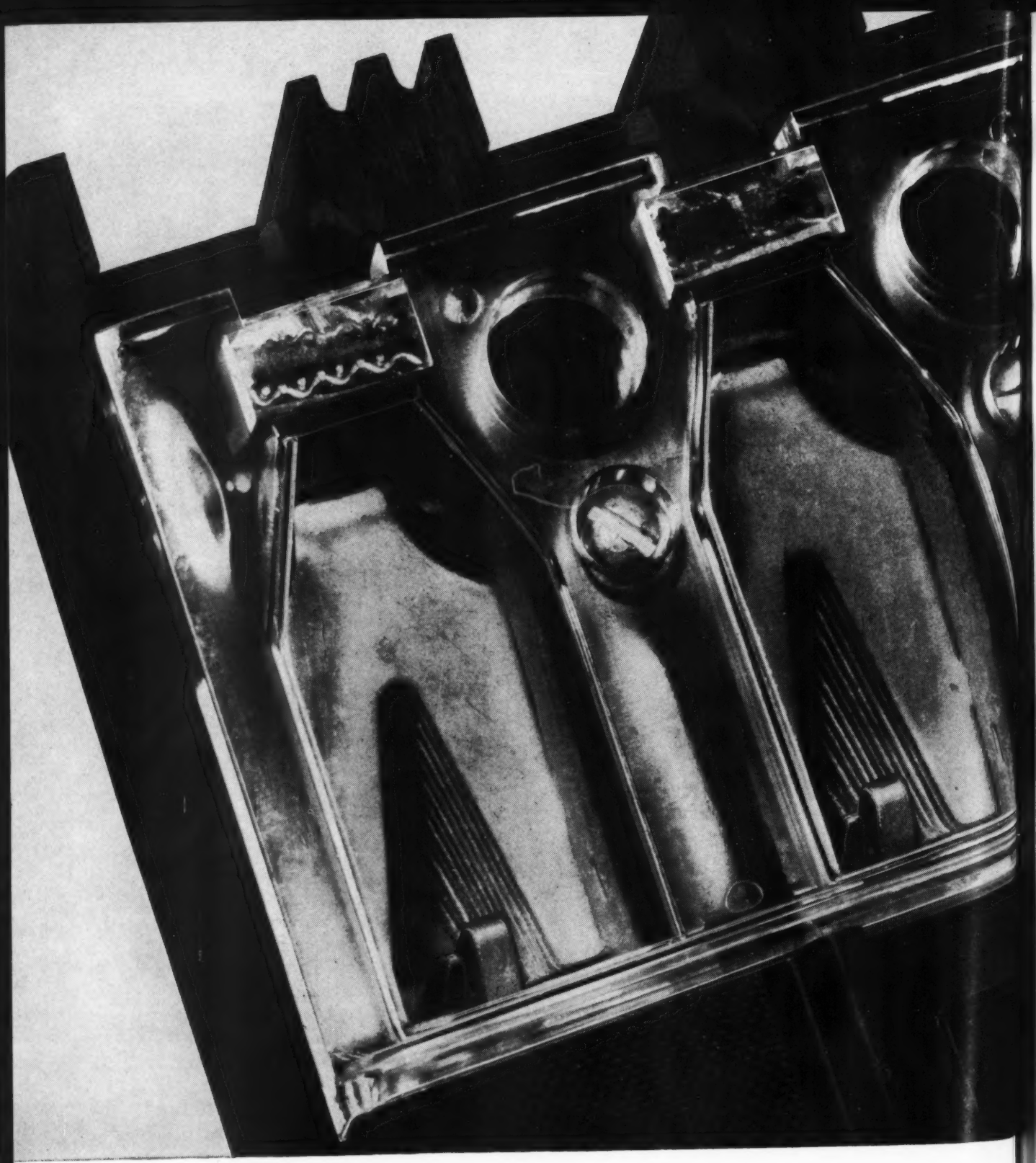
PRECIPITATOR-CYCLONE COMBINATION

Buell Cyclone collectors pay off two ways: extra efficiency from the start . . . and extra years of operation, with little if any maintenance. Unique features like Buell's exclusive Shave-off deliver an extra percentage of dust collection efficiency: in nearly all cases, Buell installations pay for themselves in just a few years. And heavy plate construction, scientific proportioning, side entry of dust-laden gases are reasons why they keep on earning for many, many years. For specific details, write for "The Collection and Recovery of Industrial Dusts". Just write Dept. 47-L, Buell Engineering Company, Inc., 123 William Street, New York 38, New York.



buell®

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**



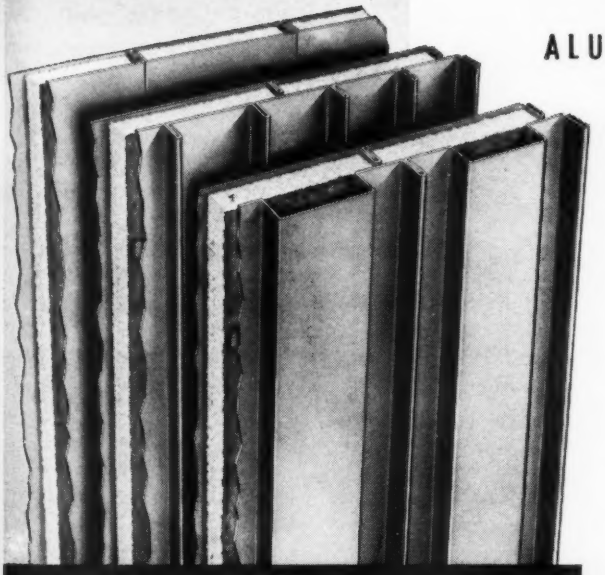
World's First Breake

with the Contacts VISIBL

INSULATED METAL WALLS

for INDUSTRIAL and COMMERCIAL BUILDINGS

ALUMINUM, STAINLESS or GALVANIZED STEEL



FLUSH, RIBBED, or FLUTED
Over-all "U" Factor is Superior to a Conventional Masonry Wall with Furred Lath and Plaster

The low-cost permanence of Insulated Metal Curtain Walls are today being designed into an ever broadening range of building types. In the Eastland Shopping Center, illustrated below, you see an unusual building in which Mahon Metal Curtain Walls in harmonizing colors were used in combination with other materials to produce an attractive and colorful exterior. Some of the country's outstanding designers have employed Mahon Insulated Metal Curtain Walls to good advantage in producing striking exterior effects in office buildings, shopping centers, schools, armories, military barracks, sports arenas, parking garages, warehouses, and industrial buildings of all types—including powerhouses. From a cost standpoint, Metal Curtain Walls save as much as 50% of the cost of masonry walls in some types of buildings. In Mahon Insulated Metal Walls, vertical joints are invisible—symmetry of pattern is uninterrupted across the wall surface . . . and, the field constructed walls can be erected up to sixty feet in height without a horizontal joint. These two design features, which are extremely important from an appearance standpoint, were engineered into Mahon Insulated Metal Curtain Walls to give you a finer appearing wall surface with a continuous pattern free from unsightly joints. You'll want these Mahon "better look" features when you select a metal curtain wall for any type of building. See Sweet's Files for information, or write for Catalog W-58.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

Sales-Engineering Offices in Detroit, New York and Chicago • Representatives in Principal Cities

Manufacturers of Insulated Metal Curtain Walls and Wall Panels; Underwriters' Rated Metal-clad Fire Walls; Steel Roof Deck and Long Span M-Decks; Permanent Concrete Floor Forms; Acoustical and Troffer Forms; Electrified M-Floors; Rolling Steel Doors, Grilles, and Underwriters' Labeled Rolling Steel Fire Doors and Fire Shutters.



Eastland Shopping Center, Detroit, Michigan. 56,000 Sq. Ft. of Mahon Insulated Metal Curtain Walls and 48,000 Sq. Ft. of Mahon Steel Roof Deck were employed in the construction of this outstanding and colorful structure. Victor Gruen & Associates, Architects. O. W. Burke Company, General Contractors.

MAHON



As General Electric sees it...

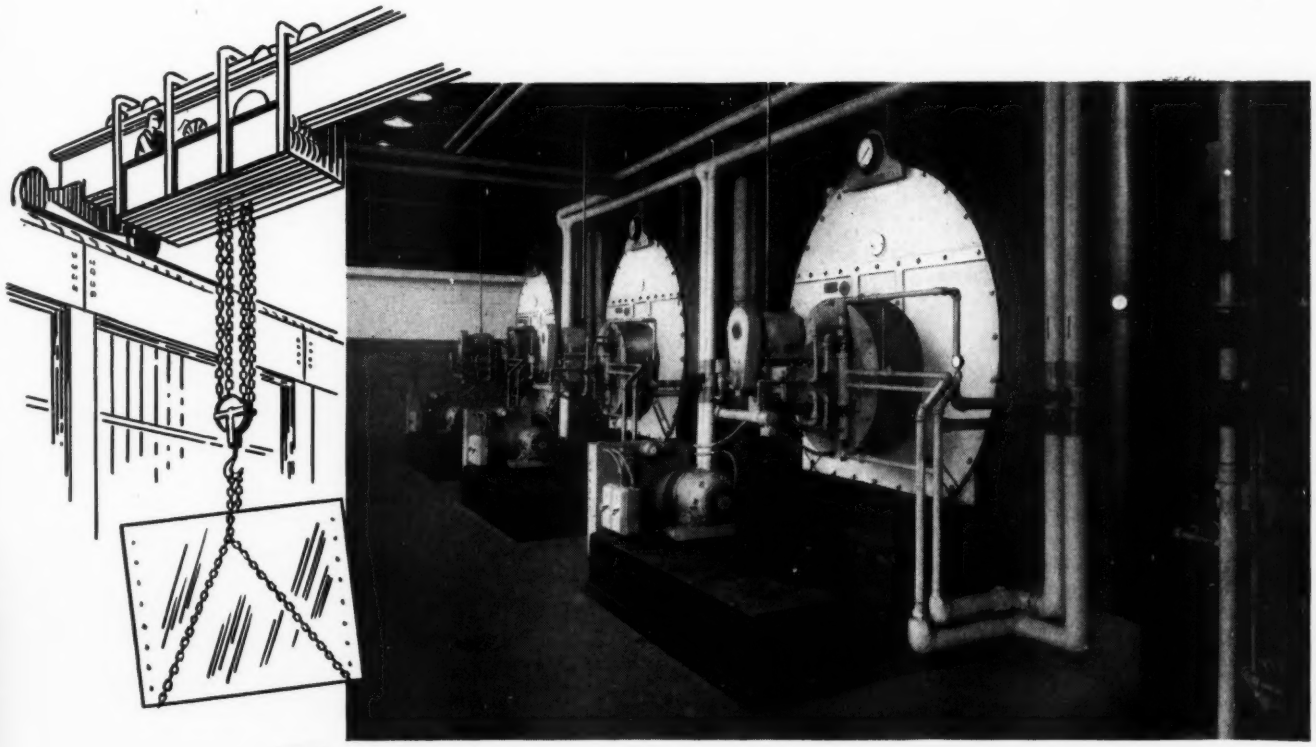
LIGHTING PROGRESS

The fluorescent lighting industry has made tremendous progress in recent years. Advances in architectural styling, backed by new fixture designs and better application techniques, have brought to millions better light for modern living.

But progress almost always awakens new problems. So it is with lighting. For modern fluorescent installations, with all their style and efficiency, necessitate increasingly rigid control of ballast operating temperatures. Here's why:

New architectural designs incorporate lower ceilings, and sound-absorbing ceiling materials. Lighting fixtures are flush-mounted or recessed. There is also a growing demand for

from Steel Plate to Steam Production



only SUPERIOR *takes all these steps to insure Satisfaction...*

HEAVY DUTY DESIGN

Bigger, heavier and more ruggedly designed, Superior Steam Generators are integrated engineered so that all components are matched in size and function to one another.

CODE CONSTRUCTION

5 sq. ft. of heating surface per b.h.p. . . . induced down-draft design . . . sized to capacity boiler shells . . . for longer life at high efficiency.

FACTORY FIRE TESTED

Completely fire tested before shipment . . . adjusted to peak performance, and guaranteed on the basis of these actual tests.

SHIPPED COMPLETE

Set it on any floor capable of supporting its weight; tie into fuel, steam and electric lines, and you are ready to start producing steam . . . efficiently and economically.

STARTED ON THE JOB BY FACTORY TRAINED EXPERTS

Superior responsibility ships with the boiler in the form of a factory trained expert, on hand to start the boiler, to adjust it on the job to peak performance, and to instruct operating personnel.

Because Superior Steam Generators are complete packages, designed, engineered and built by Superior Combustion Industries, Inc., they are backed by undivided responsibility . . . responsibility that goes beyond manufacture, and includes factory fire testing before shipment, and factory trained personnel at the installation point to start the boiler initially, adjust it to peak performance, and to advise the operating engineer on how to get the most out of the unit.

Superior Steam Generators are not only designed and built better, they are given the right start on the job.

18 sizes from 20 to 600 b.h.p. for pressures up to 250 p.s.i. or for hot water. For complete details, write for Catalog 907.

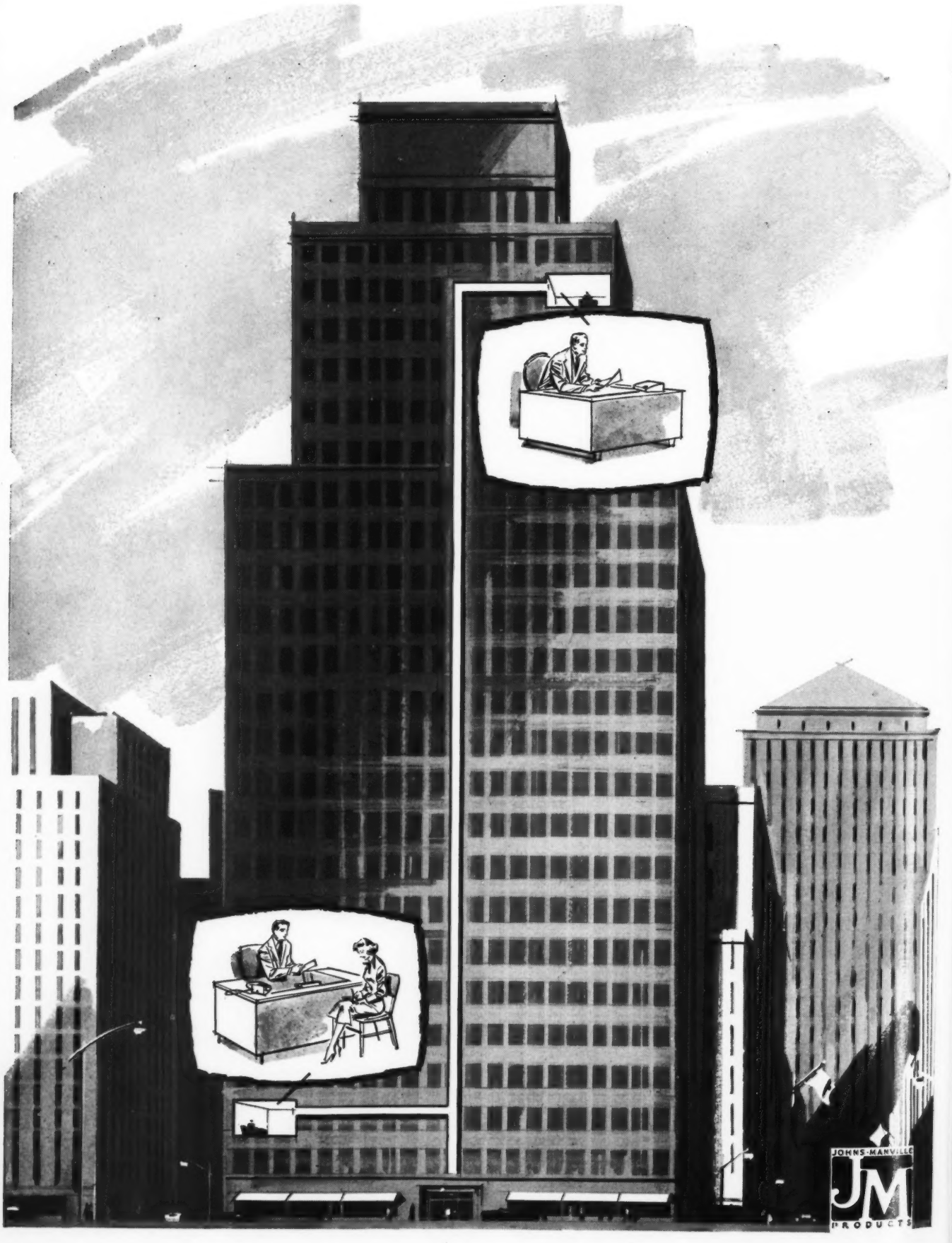
SUPERIOR COMBUSTION INDUSTRIES INC.

SUPERIOR STEAM GENERATORS

TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

Plants in EMMAUS and WILKES-BARRE, Pennsylvania

Mr. Smith is 600 duct feet farther from



the fan room than Mr. Jones, yet . . .

both men work comfortably at the same temperature!

when ducts are *fitted square and tight* with Johns-Manville semi-rigid Spintex Insulation

SEMI-RIGID SPINTEX® works two ways to lessen heat loss, stop condensation: first, with low conductivity . . . then, with its square, tight fit. The structural strength of this material, which is fastened snugly to duct surfaces with pins and clips, prevents "ballooning" due to duct leakage. And butted or mitred joints eliminate stretching and thinning of the insulation at corners. Instead, there's a full thickness of Spintex—with full protection against heat loss and condensation—over the *entire duct area.*

This two-way "edge" in insulating effectiveness is the big reason why leading architects everywhere specify semi-rigid Spintex . . . for factories, institutions and office buildings of every description.

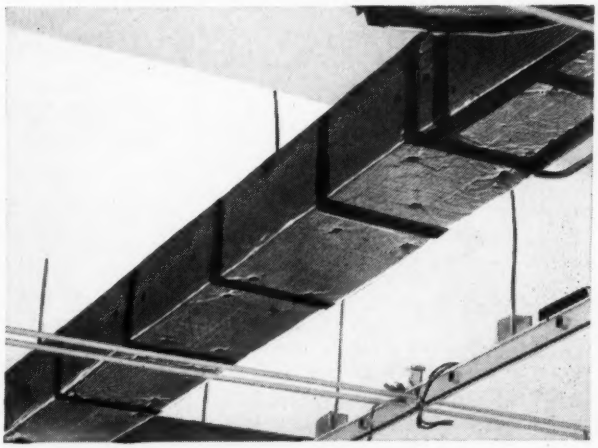
Produced by a new Johns-Manville spinning process, today's Spintex offers more insulating value than ever. Its mineral fibers are smaller in diameter, and substantially more uniform. This improved fibrous structure adds countless heat-blocking dead-air spaces per cubic inch to help keep working temperatures precisely the same throughout the structure . . . with minimum operating costs!

Your Johns-Manville sales representative will be pleased to send you information, along with samples of Spintex and J-M facing materials. Why not call him today. Or write Johns-Manville, Box 14, New York 16, N. Y. In Canada, 565 Lakeshore Road East, Port Credit, Ontario.

LESS HEAT LOSS...NO CONDENSATION AT CORNERS!
Semi-rigid (not flexible) Spintex fits squarely and tightly all duct surfaces. Stretching and thinning at corners, unavoidable with wrap-around insulations, are eliminated completely. Instead, Spintex retains full thickness everywhere to stop heat loss and condensation. Its structural strength prevents "ballooning."

FACED FOR ANY SPECIALIZED NEED!
J-M offers you a facing to meet any vapor condition, incombustibility requirement or decorative need. Provides good base for plaster finish . . . or where no facing is indicated, Spintex presents an attractive appearance with trim, tidy joints.

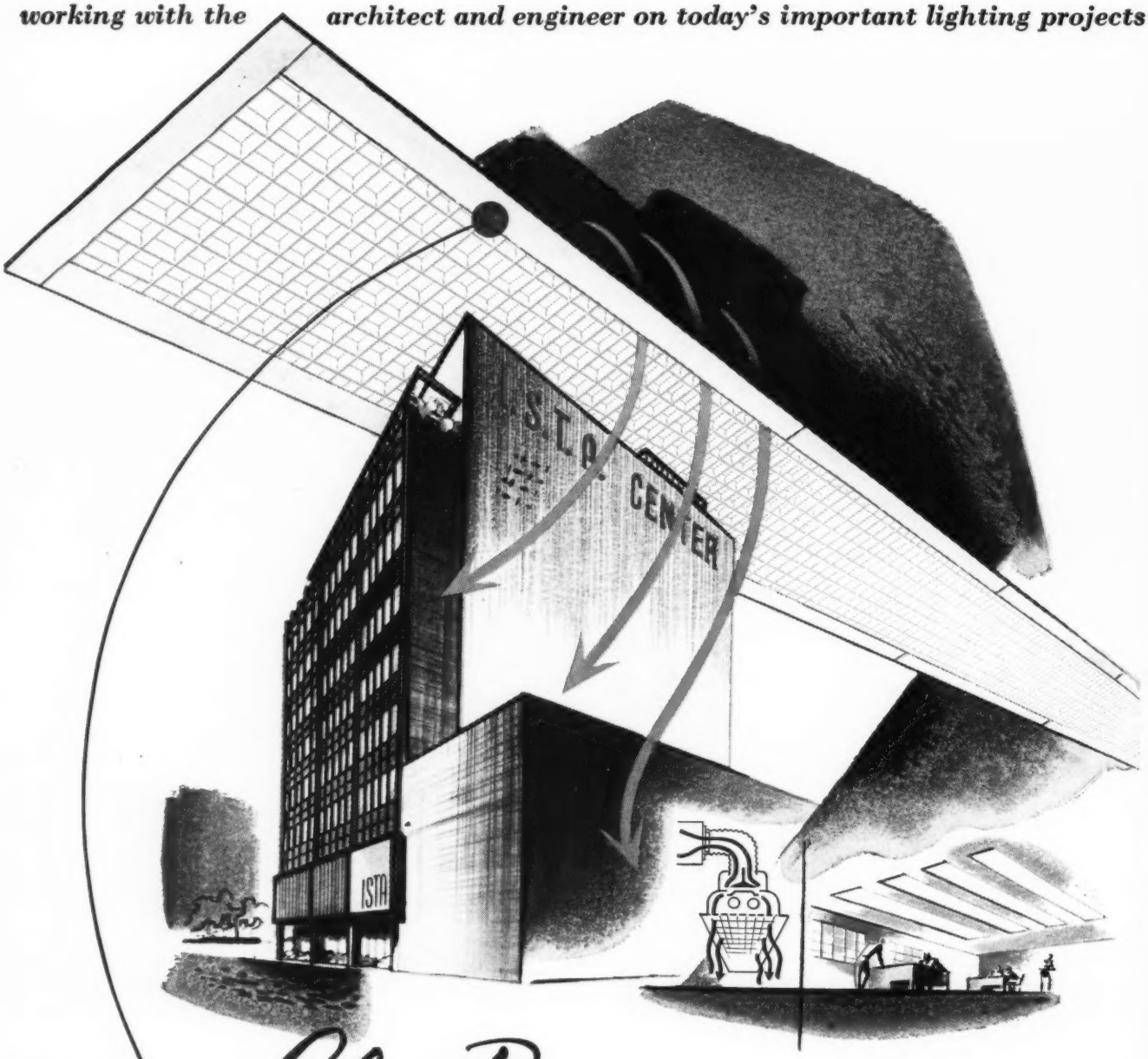
INSTALLS QUICKLY . . . ECONOMICALLY.
Spintex is clean, sanitary and "friendly" to handle. It cuts readily with an ordinary knife. Installs quickly, easily, even when ducts are curved or in difficult-to-reach areas.



AIA FILE NO. 37-D-1-2

JOHNS-MANVILLE

working with the *architect and engineer on today's important lighting projects*



1 mile of *Ceiling Beauty* doing double duty

both lighting and air conditioning from one fixture!

These new double-duty fixtures bring a new freedom to creative architecture. Gone is that discord of fixtures and air outlets! Instead: clean-lined, uncluttered ceiling beauty. Air outlets are engineered right into the lighting system! Result: greater economy, comfort and ceiling beauty. No double installation problems . . . improved draft-free air diffusion . . . modern, well-diffused, high efficiency Benjamin troffer lighting. Free illustrated brochure brings you the whole fascinating story of this new 2-in-1 fixture. Write: Benjamin Electric Mfg. Co., Dept. CEN, Des Plaines, Ill.

INDIANA STATE TEACHERS ASSN. CENTER—over a mile of Multi-Vent Trofferlites helps to make it Indianapolis' newest, most modern office building.

Architects: **McGUIRE & SHOOK AND ASSOCIATES**

Consulting Engineers: **J. M. ROTZ ENGINEERING CO.**

General Contractor: **LESLIE COLVIN**

Electrical Contractor: **HATFIELD ELECTRIC CO., INC.**

Heating and Plumbing Contractor: **FREYN BROTHERS, INC.**

—all of Indianapolis, Ind.

B-171R

MULTI-VENT TROFFERLITES

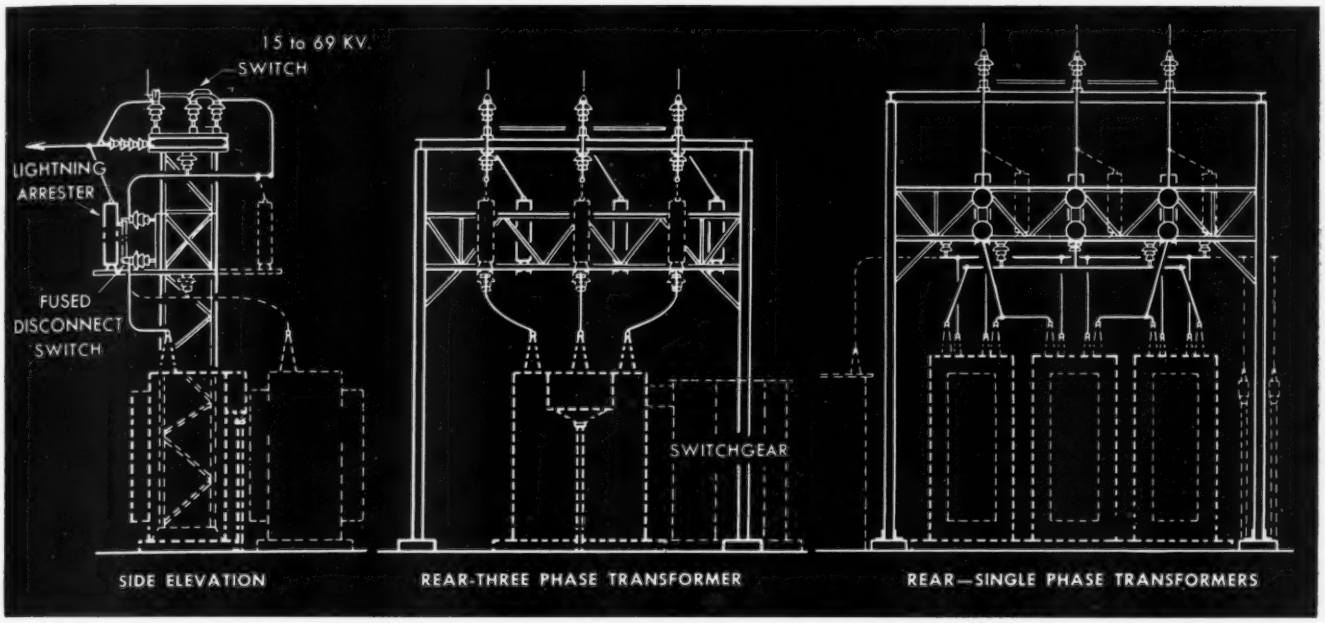
Multi-Vent® Air Diffuser by Pyle National Co. • Trofferlite by Benjamin Electric Mfg. Co.

BENJAMIN

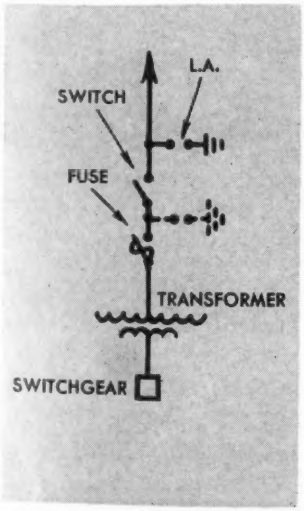
...always the source of good lighting

Now Setting the Pace in COMMERCIAL LIGHTING

R&IE STANDARD SUBSTATIONS



Standardized Structures Save Your Engineering Manpower



Single-line diagram of step-down structure for 15 to 69 Kv. Several arrangements and options available.

ORDERING EASIER • DELIVERY QUICKER • ERECTION SIMPLER

ATTENTION—Industrial Power Engineers, Consulting Engineers, Power Company Industrial Sales Representatives and Contractors:

When you have need for a transformer structure for high voltage industrial application, here's the quickest and easiest way to get one. Specify an R&IE Standard "SD" Substation.

Six definite advantages are:—

1. Simplified Ordering—minimize listing and checking of miscellaneous items, often more detailed than necessary.
2. Quick Delivery—eliminate design engineering time. Parts and assemblies are standardized for fast service.
3. Simple Erection—parts and components coded and marked for positive identification and fast erection.
4. Lower Costs—accumulated savings in engineering, production and erection time, add up to lower costs for your substation.
5. Selection of Switches—include vertical break, side break and tilting insulator types.
6. Experience—over forty years designing and detailing every type of structure provides know-how for standardization.

Standard structures by R&IE can help supply industrial power easier, get power revenues quicker.

R&IE EQUIPMENT DIVISION
I-T-E CIRCUIT BREAKER CO. **GREENSBURG, PA.**

Mail Bulletin 2006A to—

NAME_____ TITLE_____

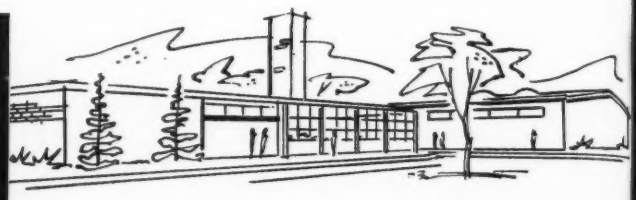
COMPANY_____

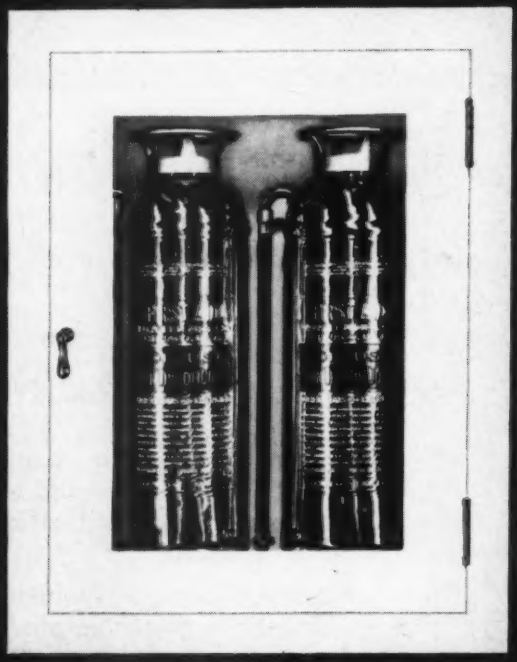
ADDRESS_____

R&IE

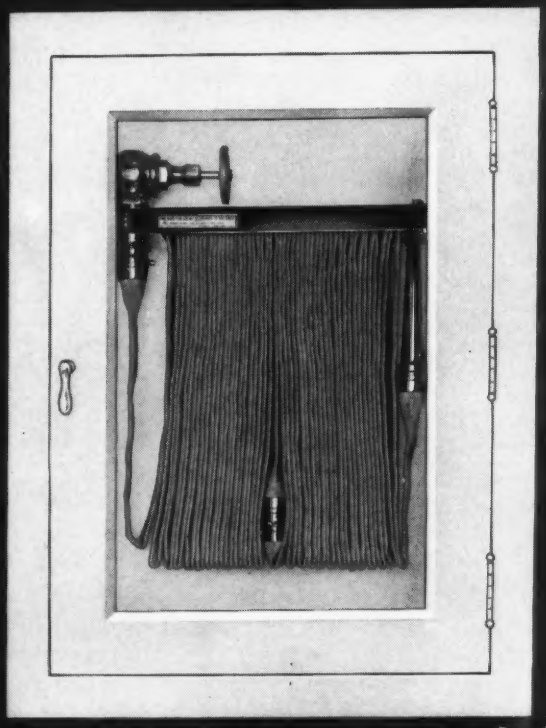
For Interior Fire Protection in SCHOOLS and CHURCHES . . .

Of the many distinct ALLENCO *models, these two are most popular for installations in this field.*





Allenco Fig. 285 is notably compact, contains one or two fire extinguishers and, if specified, tamperproof door.



Allenco Fig. 262 is "custom-sized" to suit choice of 5 hose-lengths, 4 hose-sizes with plain or fog nozzles, with optional spanner and bracket, and space limitations of any application-point.

Cabinets of both units are available in several groups—Allenco Satin Finish Hollow Steel Door, Nella Sheet Steel Door, Aluminum Doors, and other styles. Rigid and true-to-size, they go in faster . . . look better . . . serve perfectly.

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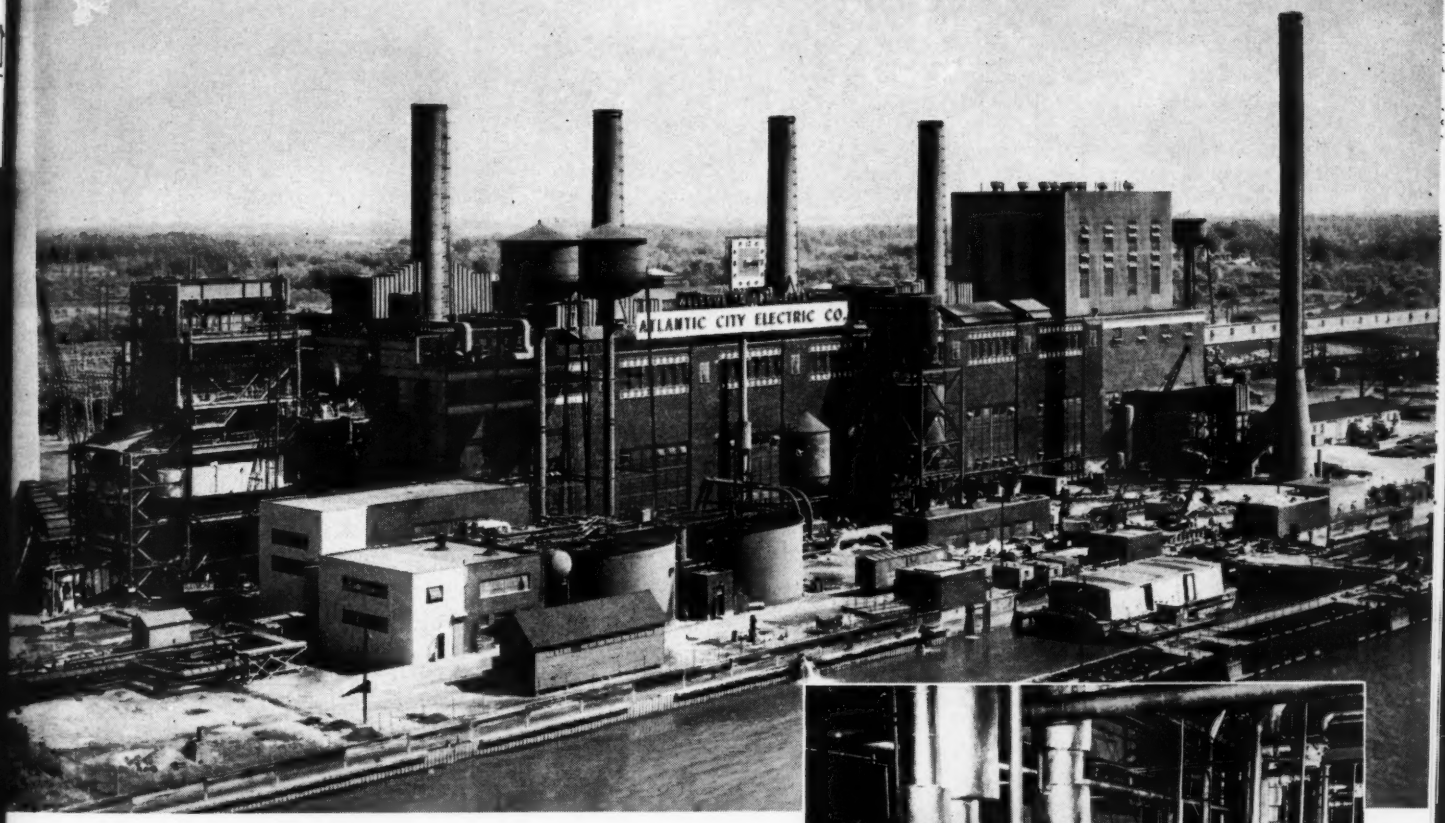


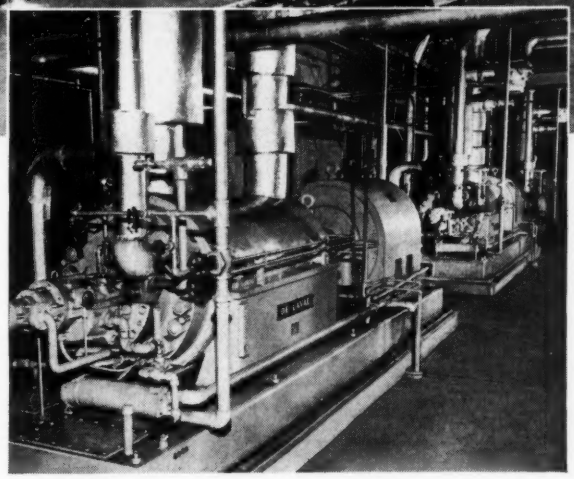
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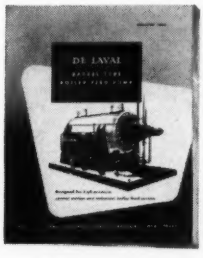


Three ten-stage De Laval high pressure, barrel type boiler feed pumps, are on the line at the Deepwater Station of the Atlantic City Electric Company. Shown above is an aerial view of this station located in Penns Grove, New Jersey at the southern end of the Jersey Turnpike. Each pump delivers 675 gpm to the boiler for a total flow of 685,000 pounds per hour. Each pump operates at 1762 psi with temperature at 287 F., and is driven by a 900 hp motor.

When it came time to modernize one of their existing facilities, Atlantic City Electric Company and Gibbs & Hill, Inc., consulting engineers, chose two similar De Laval pumps to serve a new 79,000 kw generator.

IMO Pumps For Fuel Oil Service

Also doing an important job in this Atlantic City Electric Company station are De Laval IMO screw-type positive displacement pumps. They supply fuel oil to the burners round the clock.



Send for De Laval Bulletin 1506, which contains helpful data.

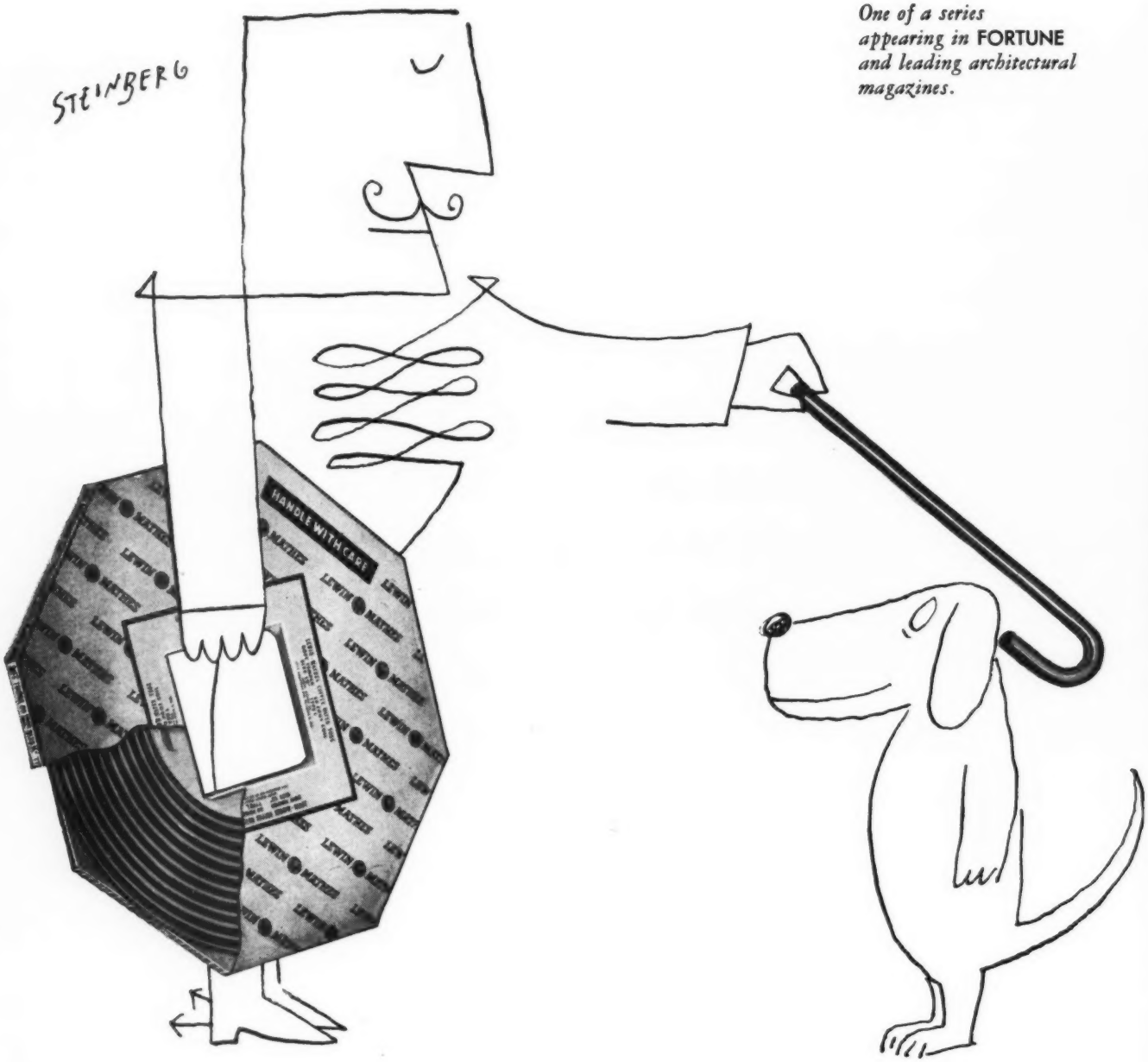
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Surface defects led to the above "Question Mark" fitting being cut from the piping. Further examination showed the steel inside was laminated. Pieces cut out literally fell apart. Here was an open invitation to serious trouble . . . lost production, wasted dollars and possible human casualties.

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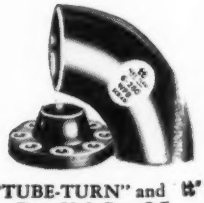
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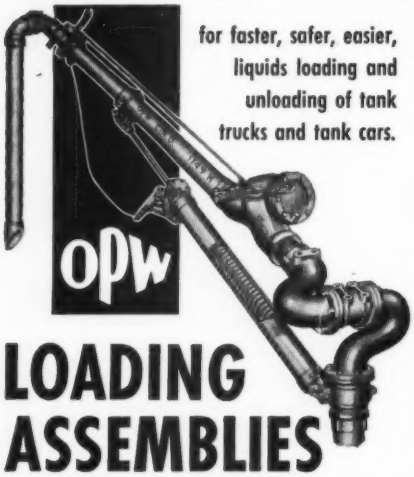
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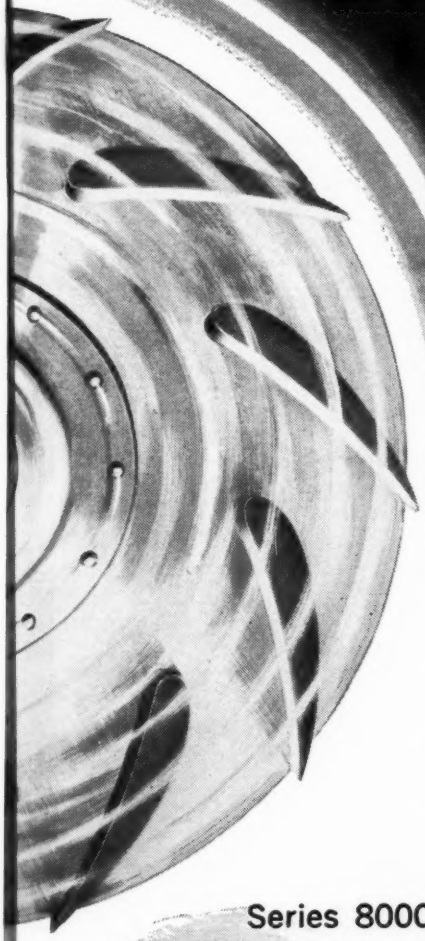
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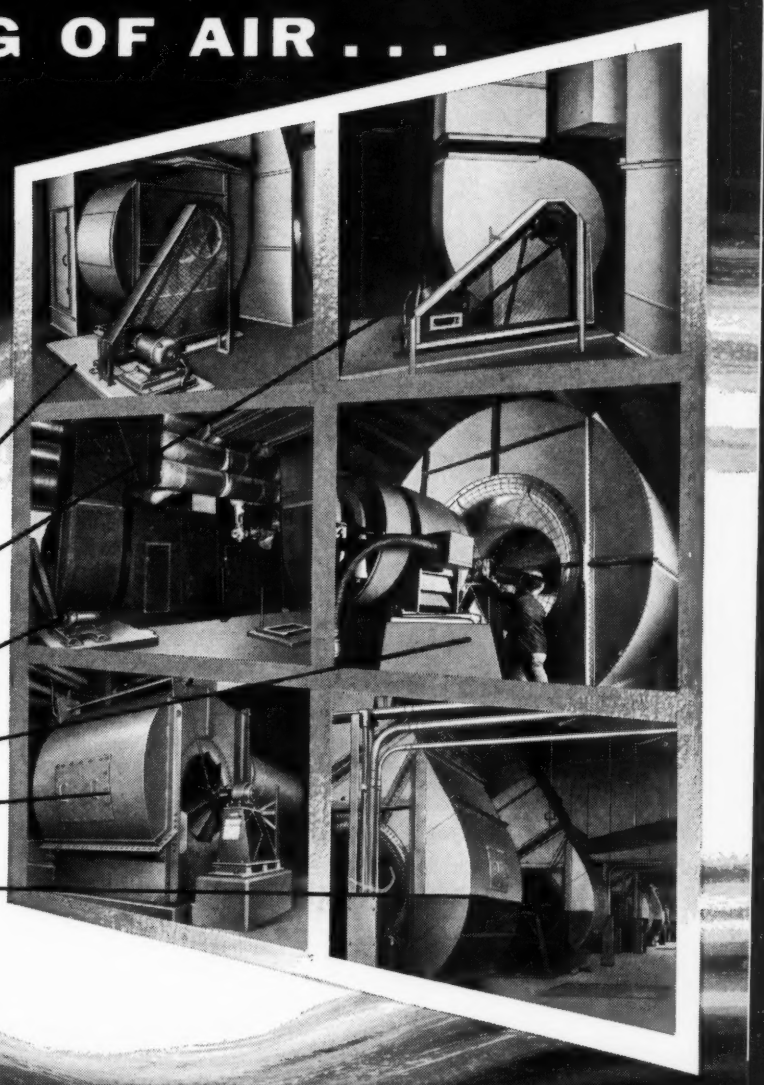
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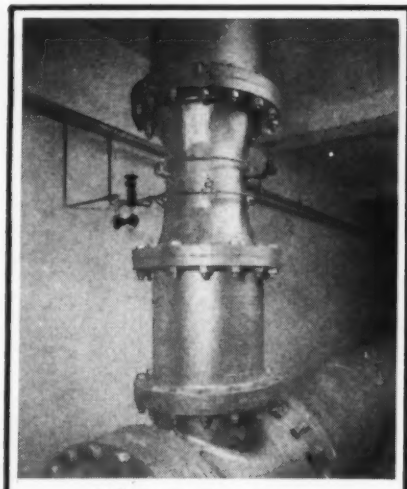
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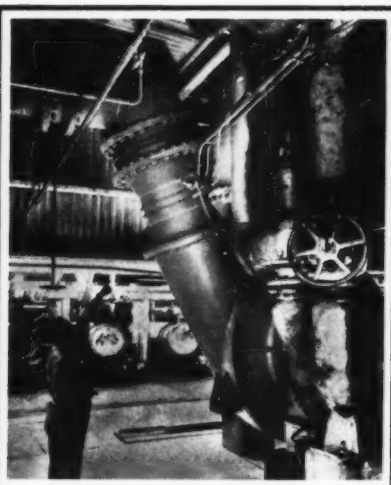
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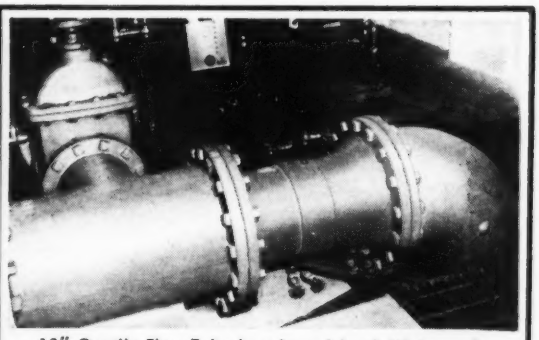
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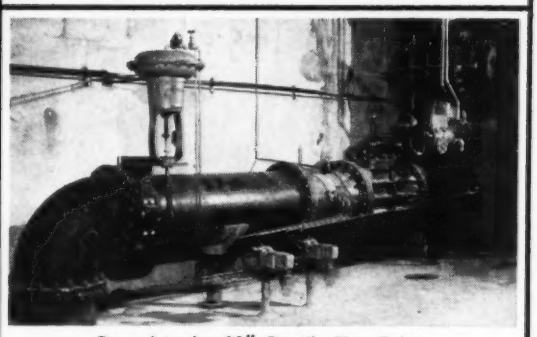
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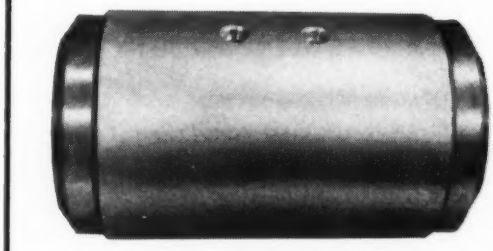
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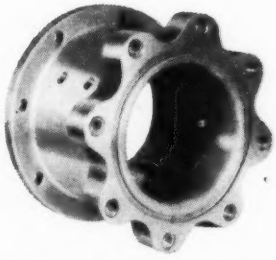
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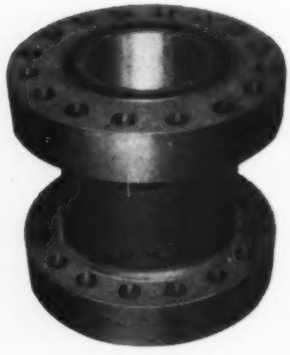
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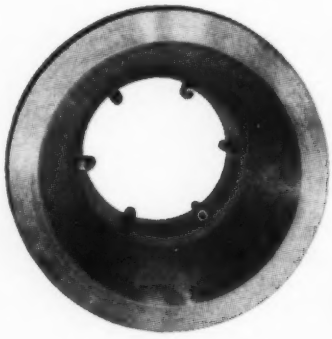
8" Gentile Flow Tube with Welding Ends.



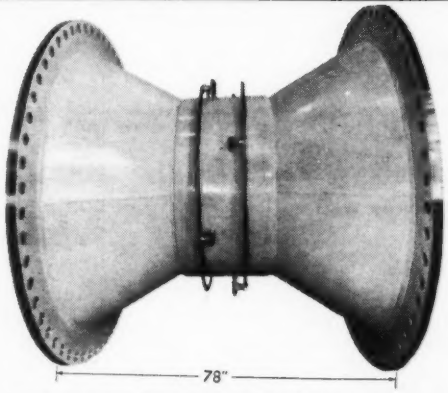
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Gentile Flow Tube for 2500 PSI.



Axial view of 8" Flow Tube with 5.125 contraction.

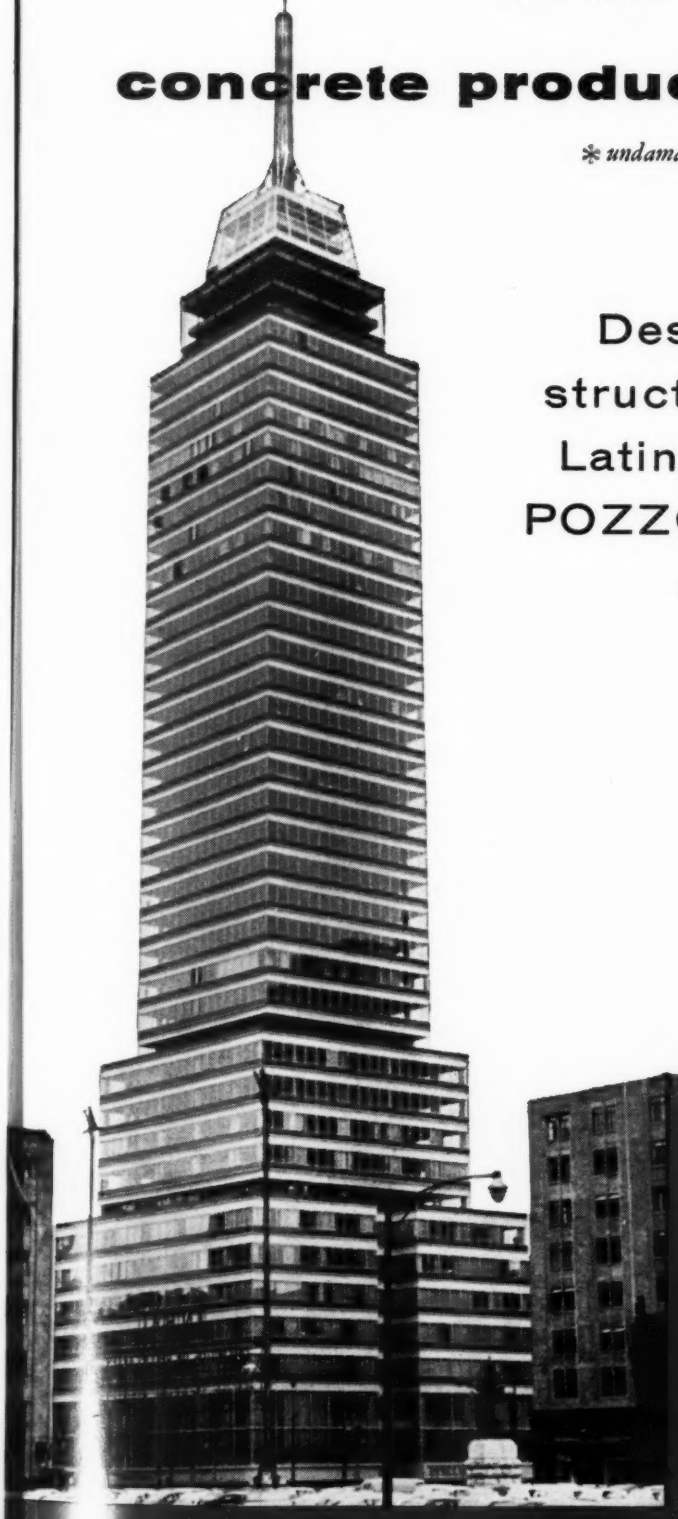


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Typical section of the foundation of the Latino-Americana tower, designed partly as a floating box and partly pile-supported, consists of concrete girders atop a base slab to make piles act as unit.

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The I-T-E Cordon plug-in circuit breakers pictured in the control board above distribute current to machines in the Yorklyn, Del., plant of National Vulcanized Fibre Co., world's largest manufacturer of vulcanized fibre.



"We selected I-T-E breakers to solve our problem in the manner we desired," says John L. Bahr, chief engineer for National Vulcanized Fibre Co.

"I-T-E CORDON® Plug-in Breakers Proved the Most Economical and Convenient Way to Meet Our Increased Power Capacity Needs"

"The growth of our company over the years required the addition of a public utilities tie line into our Yorklyn, Del., plant to supplement the plant's generating facilities. This move created two problems: it meant that we would have to substantially increase the maximum potential current interrupting capacity of our control board; and within a limited amount of space available.

"After considering several possibilities, we found that I-T-E Cordon plug-in type circuit breakers would solve both problems. We were able to satisfy our interrupting capacity requirements in the existing control board space. And plug-in features permit taking out any circuit when necessary without shutting down the entire board."

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**Amp-trap is a registered trademark of the Chase-Shawmut Co.*

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Bring your Technical Reference Files up to Date

Part 2 February 1957

AIR CLEANING AND DUST COLLECTION



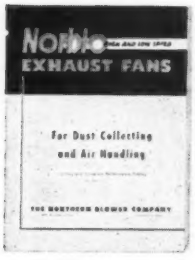
1—Dust Recovery

"The Collection and Recovery of Industrial Dusts" is a 28-page booklet detailing and illustrating all three Buell systems of industrial dust recovery: cyclone, electric precipitator, and low resistance fly ash collector. Indexed bulletin fully covers operating principles, sizing methods, and design details of each. *Buell Engineering Co.*



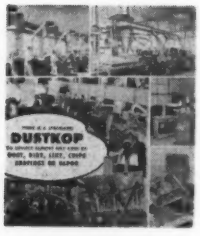
2—Mines Dust Control Systems

Catalog MM-4001, four pages, outlines the outstanding features of new Chem-Jet dust control systems for all phases of materials handling in metal and nonmetallic mines. Photos show typical points of application. It also describes new Type A Hydro-Precipitator for control of gases with dust smaller than 5 microns in size. *Johnson-March Corp.*



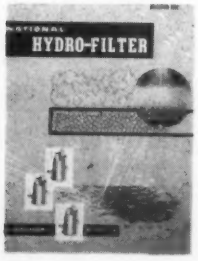
3—Exhaust Fans

Catalog 1002-6, 32 pages, contains complete performance tables for Norblo high and low speed exhaust fans for dust collecting and air handling. Included are drawings of standard and special arrangements, tables of dimensions and capacities, a friction chart, test curves, and instructions on figuring requirements. *The Northern Blower Co.*



4—Dust Collectors

Bulletin 636-B contains illustrations and specifications on the complete Aget line of Dustkop Dust Collectors. It lists applications and tells how to install. It also shows how to figure size and type of equipment needed to solve any dust collection problem. Capacities are 300 to 10,050 cfm for each unit. *Aget Mfg. Co.*



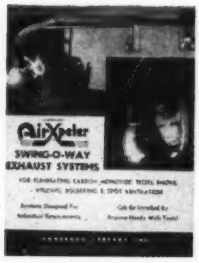
5—Dust Collectors

Outstanding features of the National Hydro-Filter Dust Collector are described in four-page bulletin 556. Ease of operation and maintenance, versatility, cost factors, separating efficiency, controls, and construction and design are discussed. Dimensional data, specifications, and drawings also are provided. *National Dust Collector Corp.*



6—Dust Control Equipment

Illustrated, 40-page catalog 800, "Industrial Dust Recovery and Control," describes the complete line of Dracco equipment for preventing spread or waste of dust. It includes engineering data, dimensions, and specifications for all system components, and gives details and user advantages for existing systems. *Dracco Corp.*



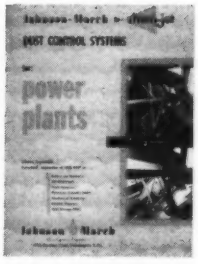
7—Movable Dust Exhauster

The AirXpeler Swing-O-Way Exhaust System for eliminating carbon monoxide, diesel smoke, and welding and soldering fumes, and for spot ventilation are described in two-page bulletin 675R. Units are designed for use where traveling overhead cranes do not permit duct work from the ceiling. *Ammerman Company, Inc.*



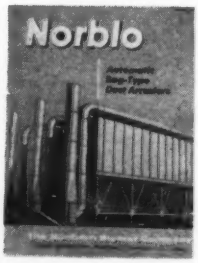
8—Electric Precipitators

The five basic engineering factors governing the success of precipitator installations are fully described and illustrated in a 22-page booklet, "Buell SF Electric Precipitators." Factors include positive gas flow control, uniform electrode emission, rapping method, mechanical construction, and high voltage supply. *Buell Engineering Co.*



9—Dust Control Systems

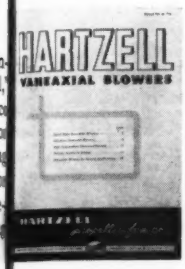
Six-page catalog SJP-1001 describes new Chem-Jet dust control systems for suppression of coal dust at rotary car dumpers, car shakeouts, track hoppers, conveyor transfer points, coal crushers, reclaim hoppers, and coal storage piles. It includes description of new Type A Hydro-Precipitator Scrubber for dust and fume control. *Johnson-March Corp.*



10—Automatic Dust Collectors

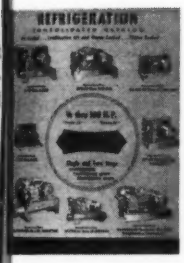
How the Norblo automatic bag-type dust collector can provide continuous operation at full capacity is explained in four-page folder 164-5. Dimensions and capacities are listed in tabular form. A flow diagram explains how the unit works. Each part of the collector is shown separately with a description of advantages. *The Northern Blower Co.*

AIR CONDITIONING, HEATING, AND VENTILATING



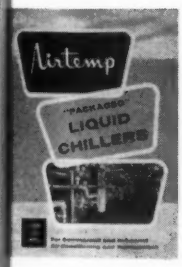
11—Vaneaxial Blowers

Sixteen-page bulletin A-110 gives descriptions, specifications, dimensions, and performance data on direct drive, belt driven, high temperature vaneaxial blowers in sizes from 12 to 54 in., including portable vaneaxial blowers. Blowers are listed for use against pressures as high as 7½-in. water gage. *Hartzell Propeller Fan Co.*



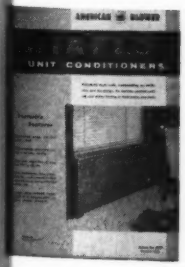
12—Refrigeration

Condensed catalog 493, eight pages, gives complete specification data on refrigeration units—air cooled, combination air and water cooled, and water cooled—in the ¼ through 100 hp range. Single and two stage compressors, compressor units, and condensing units are shown with suggested uses. *Brunner Mfg. Co.*



13—Liquid Chillers

Packaged liquid chillers for commercial and industrial air conditioning and refrigeration, including chiller, heat exchanger, control panel, motor, oil tank and separator, radial compressor, and condenser in one unit, are described in 28-page bulletin ACC-225. Roughing-in dimensions and capacities are given. *Airtemp Div., Chrysler Corp.*



14—Air Conditioners

Four-page bulletin 8227 describes the new Diaflo unit conditioners for summer cooling and winter heating in multi-room structures. Operation, construction, and design features are illustrated. Free standing, fully recessed, floor and ceiling mounting arrangements are shown. Dimensions and capacities listed. *American Blower Corp.*



15—Roof Ventilators

Penn Ventilator's complete line of powered and gravity roof ventilators and accessory products is shown in new eight-page bulletin NHS-57. It includes performance tables, dimensional charts, specifications, and construction details for over 15 different units for public, commercial, and industrial buildings. *Penn Ventilator Co.*



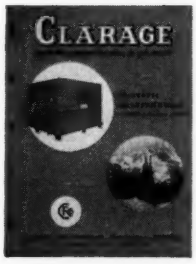
16—Gravity Roof Exhausters

Twelve-page bulletin 100 gives capacities, dimensions, curb details, and construction design of the new AirXpeler Power Gravity Roof Exhausters, units of low silhouette, available as direct or belt driven. Low cost operation for low and high static pressures, and natural draft fresh air supply features are described. *Ammerman Company, Inc.*



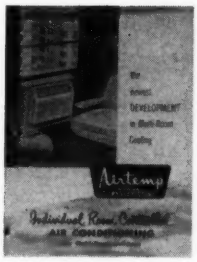
17—Heating Nomogram

"Nomogram for Finding Outlet Area for Downward Jet of Heated Air" presents a simple method for determining the size of grilles and round openings necessary to project the heated air of a given temperature to the floor. Of heavy weight plastic, nomogram will give long use. *Uni-Flo Air Distribution Div., Barber-Colman Co.*



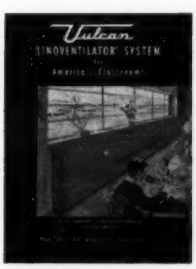
18—Air Conditioning Units

Four-page bulletin 1312 covers the Hi-Static Multitherm unit, developed principally for high velocity, conduit type air conditioning systems. Available in seven sizes, covering a volume range of about 2500 through 22,000 cfm, and suitable for systems having a static pressure of 8-in. wg maximum. Specifications are given. *Clarage Fan Co.*



19—Room Air Conditioners

Individual room controlled air conditioning for multi-purpose buildings that cools, cleans, circulates, ventilates, and dehumidifies is described in four-page folder ACC-191. Specifications, electrical characteristics, and moisture removal data are given for room air conditioners with capacities of ½, ¾, and 1 hp. *Airtemp Div., Chrysler Corp.*



20—Heating and Ventilating

Catalog LV-400, eight pages, describes the Vulcan Linoventilator System for automatically controlled heating and ventilating of classrooms. Simplicity of operation and maintenance, flexibility of operation, and low initial and operating cost are stressed. Specifications and dimensional data are included. *The Vulcan Radiator Co.*



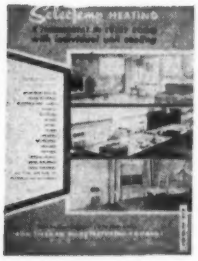
21—Lighting-Air Systems

Eight-page bulletin 390-F-57 gives a condensed but full description of the Multi-Vent Troffer air-lighting system. Drawings, illustrations, and engineering charts explain operation of this new combination air and light distribution unit. It also includes description of the standard Multi-Vent low velocity air diffusers. *The Pyle-National Co.*



22—Heating and Air Conditioning

Bulletin B-150, 20 pages, is a new general catalog of the complete line of Webster equipment. It describes radiation and unit heaters; hot water and steam heating specialties; controls; and air conditioning equipment. It includes photos, dimensions, and ratings of other major products in the Webster line. *Warren Webster & Co.*



23—Modulating Zone Heating

Application of the SelecTemp heating system to commercial buildings of all types and sizes is described and illustrated in eight-page folder 5627. This system, featuring a non-electric thermostat on each unit, provides temperature control in each individual room or area. Construction is shown. *Iron Fireman Manufacturing Co.*



24—Centrifugal Roof Ventilators

Eight-page folder SDA-220 presents the new Peerless Centrifugal Roof Ventilator. Features, construction details, complete performance data, dimensions, detail drawings, and recommended specifications are given. Other fan and blower products also are described. Engineering data are in table form for handy reference. *The Peerless Electric Co.*



25—Multi-Zone Air Conditioning

Catalog 550, 12 pages, describes how one Multi-Zone air conditioning unit heats, cools, ventilates, humidifies, de-humidifies, and filters up to 22 zones simultaneously. Specifications, dimensions, and engineering data are given for eight sizes in horizontal and vertical models with capacities from 1370 to 21,000 cfm. *McQuay, Inc.*



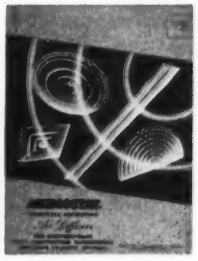
26—Electronic Control Center

The Supervisory DataCenter, an installation that collects, at a central location, key operating data of an air-conditioning system, and incorporates remote control devices to supervise the system's operation, is described in 18-page brochure TD-111. It discusses resulting reduced cost of operation. *Minneapolis-Honeywell Regulator Co.*



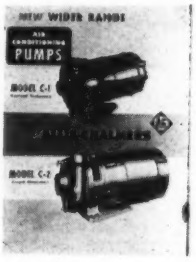
27—Cleanable Cooling Coils

Bulletin R-50 describes and illustrate Aerofin Type R Removable-Heade Water Coils. These are cleanable-tub extended-surface coils for cooling ai with water. Principal advantages ar easy cleaning of tubes and positiv drainage. Engineering data for variou pass arrangements are given to assi in selection. *Aerofin Corp.*



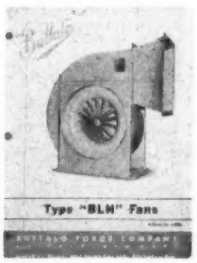
28—Air Diffusers

Four-page bulletin 29f/An cover Anemostat's wide range line of ai diffusers for conventional and high ve locity air distribution systems. It ex plains and illustrates the aspiratio principle of air diffusion and also show accessories for Anemostat air diffuser such as dampers, controls, and defle tors. *Anemostat Corp. of America.*



29—Air Conditioning Pumps

Fractional and integral horsepowe close-coupled pumps, of special intere to consultants handling air conditio ing projects, are described in six-pag bulletin 25B7529. In addition to di cussing design features, the bulleti provides performance curves and di mension data. Capacities to 150 gp heads to 140 ft. *Allis-Chalmers Mfg. C*



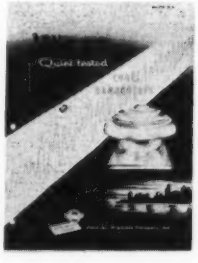
30—Heavy Duty Fans

Twenty-page bulletin F-200 covers th Type BLH heavy duty fans for in dustrial air handling for class I through IV service. Sketches an photos illustrate features of constru tion. Performance curves show hors power savings possible. Outlet veloci tables are given for each size with se lection data. *Buffalo Forge Co.*



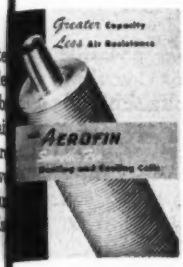
31—Cooling Coils

Marlo direct expansion and water co are described in eight-page bulle 396A. Design features, constructio types of cooling coils available, a dimensional data are covered. The fo types of coils are discussed with fi spaced either seven or eight per in with ⅝ or ¾ in. O.D. copper tub *Marlo Coil Co.*



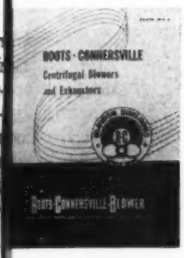
32—Direct Drive Exhausters

Direct drive roof exhausters with c pacities from 150 to 4200 cfm are d scribed in four-page bulletin 56-A. I cluded are noise level recommend tions, methods of installation, and explanation of the U-spring type vibration isolator featured on Jenn Air equipment. Performance data given. *Jenn-Air Products Company, In*



33—Smooth-Fin Heat Exchangers

Bulletin S-55 describes new smooth-fin heat-transfer coil construction that permits closer fin spacing, greater capacity per sq ft of face area, and use of higher air velocities without turbulence or excessive friction. It also illustrates many types of extended-surface heat exchangers for heating, cooling, and processing. *Aerofin Corp.*



34—Centrifugal Blowers

Bulletin 120-B-14 contains illustrations, performance characteristics, and specifications for a complete line of single stage and multistage centrifugal blowers and exhausters. Single stage units have capacities 500 to 60,000 cfm, 1 to 8 psig; and multistage units have capacities 1000 to 100,000 cfm, 8 to 600 psig. *Roots-Connersville Blower Div.*



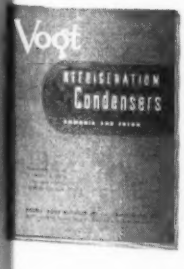
35—Sill-Line Radiation

Twenty-page Publication 30-1, Issue 1, describes Nesbitt Sill-Line Radiation — described as a new concept in high capacity finned radiation, featuring four enclosures, available in five lengths from two to eight feet. Booklet describes equipment and accessories with IBR approved ratings, and gives construction details. *John J. Nesbitt, Inc.*



36—Heating Systems

Eight-page bulletin 2101A tells you how Dunham-Bush Vari-Vac and Metro heating systems provide more comfort with smaller fuel bills in factories, stores, hospitals, schools, churches, office and apartment buildings. Actual installations are pictured, specific savings detailed, and components described. *Dunham-Bush, Inc.*



37—Refrigerant Condensers

Engineering data on a complete range of sizes and types of condensers for ammonia and freon refrigerants are given in 40-page bulletin RC-2, "Refrigeration Condensers." Closed, horizontal multipass types, and open, vertical singlepass types are featured. Piping sizes and temperature tables also are included. *Henry Vogt Machine Co., Inc.*



38—Gravity Roof Ventilators

The Swartwout-Dexter heat valve, a continuous gravity roof ventilator, is presented in eight-page bulletin HV-1. A chart shows how the heat valve compares with round ventilators in providing area of ventilating opening. Dimensions, installation drawings, and details of various types of dampers are given. *The Swartwout Co.*



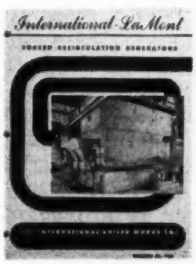
39—Air Conditioning

Precision control of air temperature and moisture enable you to produce your product in any climate, at any season, according to six-page bulletin 122. The Type "A" air conditioner described, for drying or moistening of air, is shown in typical installation photographs. Drawing points out operation. *Niagara Blower Co.*



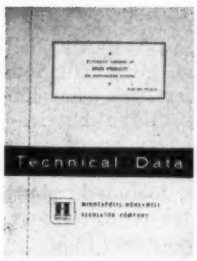
40—Water Saving Units

Bulletin 880, 16 pages, contains descriptive information, ratings, specifications, and selection data on Dunham-Bush Water Savers. Included are copper deck cooling towers and Inner-Fin evaporative condensers, constructed for use with either blower or propeller fan; and propeller fan condensers and pressure stabilizers. *Dunham-Bush, Inc.*



41—High Temperature Water Heating

Basic advantages of the Type LFW Forced Recirculation Generators for high temperature water are given in ten-page bulletin 700. Chart compares capital investment, operating costs, and maintenance and repairs for high temperature water and high pressure steam for district heating from central heating plant. *International Boiler Works Co.*



42—Duct Systems Controls

"Automatic Control of High Velocity Air Distribution Systems," technical data bulletin 77-0115, recommends the proper controls for both dual and single duct systems. Advantages of dual duct over single duct systems are discussed and drawings of each type and the possible layout variations are given. *Minneapolis-Honeywell Regulator Co.*



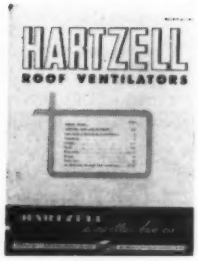
43—Air Blenders

The Westinghouse Air Blender System, a new concept for school heating, ventilating, and ventilation cooling, is detailed in eight-page booklet B-5195. It explains how system eliminates fans, filter, motors, and wiring in classrooms and how cooling is limited only by cooling capacity of outdoor air. *Westinghouse Electric Corp., Sturdevant Div.*



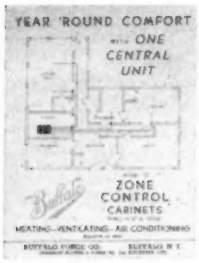
44—School Temperature Control

Sixteen-page bulletin F-7773 describes automatic electric temperature control systems that are designed to control heating, cooling, and ventilating systems used in today's modern schools. Illustrated and explained are types of installations, differences in systems, control centers, and air distribution products. *Barber-Colman Co.*



45—Roof Ventilators

Bulletin A-112, 16 pages, gives descriptions, specifications, dimensions, and performance data on the complete line of Hartzell roof ventilators, including the new reversible model, two vertical discharge models (Vertijet and Airjet), and a fan-powered rotary ventilator. Data on penthouses are included. *Hartzell Propeller Fan Co.*



46—Zone Control Cabinets

"Year 'Round Comfort with One Central Unit," four-page bulletin AC-2500, describes the Model G Zone Control Cabinets, Types PCB and VPCB, for heating, ventilating, and air conditioning where one unit must provide air for several zones. Construction and operation are covered for manual and automatic control. *Buffalo Forge Co.*



47—General Purpose Fans

Portable, self-contained general purpose fans of medium capacities for ventilating and industrial applications are covered in 12-page bulletin 563. Condensed capacity tables, fan dimensions, fan discharge views, and lists of material specifications are given, along with suggested applications for each type of unit. *The New York Blower Co.*



48—Roof Exhausters

Catalog 55-A, on the Jenn-Air belt driven roof exhausters, gives full data on a range of capacities from 1700 cfm to 13,400 cfm, and shows a cutaway drawing with a list of component parts of the exhauster. Recommended installation information is included, along with specifications and dimensions. *Jenn-Air Products Company, Inc.*



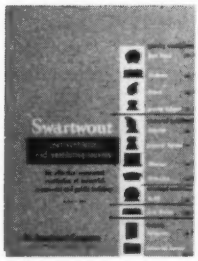
49—Multiblade Fans

Type HV multiblade fans, recommended for ventilating and air conditioning services where slow speed and extremely quiet performance are required, are described in four-page bulletin 200A. These forward curved blade fans are especially suited to installations where the available equipment space is limited. *Clarage Fan Co.*



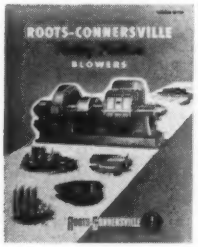
50—Bell-Ex Roof Ventilators

A centrifugal roof ventilator aerodynamically designed to exhaust against high resistance and offering flexibility, space-saving, and economy is illustrated and described in four-page bulletin 565. Capacities and dimensions are included, together with descriptions of propeller-type roof ventilators for lower resistances. *The New York Blower Co.*



51—Ventilators

Louvers and gravity, powered, an centrifugal ventilators for industria commercial, and public buildings ar described in 12-page condensed catalo 352. Dimensional drawings, installatio data, dimensions and weights, operat ing methods, and cutaways are give for the various types available. *Th Swartwout Co.*



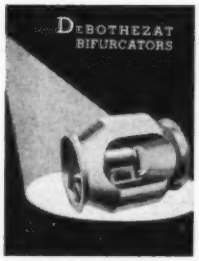
52—Rotary Blowers

Sectional views, typical installation performance characteristics, specifica tions, and illustrations of large rotar positive displacement blowers and ex hausters are contained in bulletin RB 154. Rotary, positive displacemen blowers are available for 5 to 50,000 cfm 1/5 to 10 psig pressure or equivalen vacuum. *Roots-Connersville Blower Div.*



53—Exhausters

Eight-page catalog 21-1 features th newest Nesbitt product — the Series E Blower Fan Exhauster, available with silencer section for quiet air handling and designed especially for exhaus systems in auditoriums, libraries, of fices, and wherever low sound level are important. Wide range of capacities is listed. *John J. Nesbitt, Inc.*



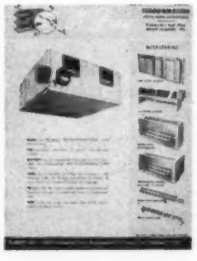
54—Bifurcator Fans

Catalog DB-37-55, 16 pages, describe operation of the Bifurcator Fan, a split housing fan that exhausts hot, corro sive, and flammable fumes. Use of th bulletin makes fan selection easy sinc it gives full information on fan laws and static pressure as well as charts on velocity pressure and on friction. *De Bothezat Fans Division.*



55—Room Air Conditioners

Marlo Seazonaire remote type roo air conditioning units for hotels, motels offices, apartments, institutions, an other multiple zone installations ar described in 16-page bulletin 335 Typical installations of floor or vertic types and ceiling or horizontal type are shown along with construction de tails. *Marlo Coil Co.*



56—Central Station Units

Catalog 505, 24 pages, describes l models of both horizontal and vertica type McQuay Seasonmaster centra station air conditioners with capacitie ranging from 640 to 21,000 cfm. Com plete charts and diagrams are include for correct selection of accessories an water, steam, and direct expansio coils. *McQuay, Inc.*



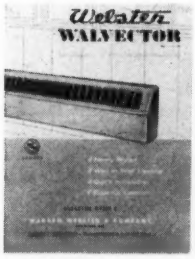
57—Airfoil Centrifugal Fans

The new Airfoil Silentvane Centrifugal Fan (Series 600) for high pressure air conditioning, industrial process ventilation, and vehicular tunnel ventilation is introduced in ten-page catalog 1125. How fans offer more air handled for less horsepower with less noise than other centrifugals is discussed. *Westinghouse Electric Corp., Sturdevant Div.*



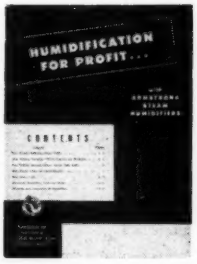
58—Radiation Enclosures

Vulcan finned-tube Linovector radiation enclosures, covers, and elements for factories, schools, hospitals, office buildings, churches, and stores are described in 32-page catalog 625 B. Ratings, dimensional data, correction factors for non-standard steam pressures and temperatures, and pipe size tables are given. *The Vulcan Radiator Co.*



59—Perimeter Heating

Webster Walvector, an improved fin-tube radiation system for perimeter installation of steam or hot water heating, is described and illustrated in 20-page bulletin B-1551. It provides details of design features, dimensions, ratings, and accessories. Typical installation photos show use in schools and office buildings. *Warren Webster & Co.*



60—Steam Humidifiers

"Humidification for Profit," 16-page bulletin 500, presents statistics that show how relative humidity affects hygroscopic materials, health and comfort, and formation of static electricity. Schematic diagrams and sectional drawings demonstrate operation of electrically and air operated steam humidifiers. *Armstrong Machine Works.*

ELECTRICAL EQUIPMENT



61—Peak Load Problems

"How Much Peak Skimming?" 24 pages, is the text of a paper presented by E. A. Armstrong, of the Electro-Motive Division of General Motors, before the Wisconsin Utilities Association Convention. It details the application of Electro-Mobile Power in solving peak load problems on utility systems. *Electro-Motive Div., General Motors Corp.*



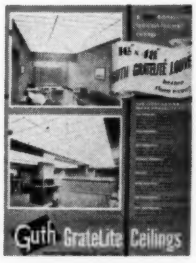
64—Lamp Ballasts

This fluorescent lamp ballast buyer's guide includes information on newly designed fluorescent lamp ballasts with smaller cross section dimensions, greater efficiency, and quieter operation. The bulletin describes core and shell laminations, coils, capacitors, and cases. Dimensions and specifications are given. *Advance Transformer Co.*



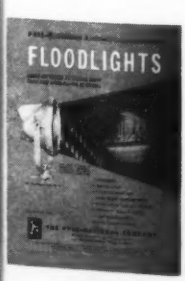
62—Electrical Connectors

Four-page bulletin announces and describes in detail the new Super Twist-Lock line. Diagrammatic drawings and illustrations show how the new units are designed with dead front, two piece cap, and screwless terminals. Six simple wiring steps, that cut wiring time up to one third, are illustrated and explained. *Harvey Hubbell, Inc.*



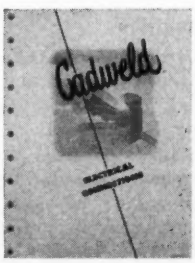
65—Over-all Ceiling Lighting

This packet of two and four page brochures features the Gratelite Louver Diffuser for over-all ceiling lighting. It includes full installation, performance, and construction data; description of the new Una-Tee suspension system; time-saving estimating tables, and Gratelite ceiling layout information. *Edwin F. Guth Co.*



63—Floodlights

How to secure long range economy in floodlighting installations is told in four-page bulletin 636. Actual installation photos are shown to illustrate the wide range of applications for Pyle-National enclosed cast aluminum floodlights, such as for railroad yards, stadiums, and as night illumination on buildings. *The Pyle-National Co.*



66—Electrical Connections

Cadweld process described in 76-page electrical connection catalog is a method of welding copper to copper or steel without an outside source of heat. Equipment to form many types of electrical connections is described. Types of connections include cable, ground rod, horizontal and vertical surface, rail bonds, and studs. *Erico Products, Inc.*



67—Control Centers

"Westinghouse Control Centers," 32-page bulletin, analyzes advantages gained with control centers in small shops with a few motors, office buildings, stores, power plants, and in large industries. Charts and tables are included to help you select the proper control center arrangement for the job. *Westinghouse Electric Corp.*



68—Products Guide

This 16-page bulletin contains descriptive data on major products manufactured by I-T-E, such as: power switching equipment, metal-enclosed bus, metal-clad and low voltage metal-enclosed switchgear, unit substations, air circuit breakers, network analyzers, mechanical rectifiers, and porcelain insulators. *I-T-E Circuit Breaker Co.*



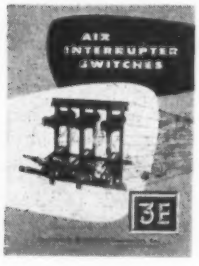
69—Air Circuit Breakers

Bulletin GEA-5915, 16 pages, describes the AK line of magnetic air circuit breakers for low-voltage (600 v and below) applications. It includes application information for applying breakers individually or in selective or cascade systems. Dimensions and specifications cover indoor and outdoor use. *General Electric Co.*



70—Motor Selector

"Reliance Motor Selector," 12-page bulletin B-2103-1, is a working tool for engineers specifying a-c motors, for general or special services. It lists speed-frequency relationship, explains design classes, lists current and torque values and frame sizes, and gives suggested applications for each motor type. *Reliance Electric and Engineering Co.*



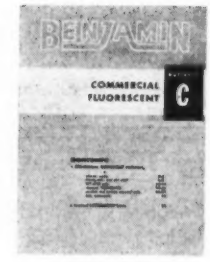
71—Air Interrupter Switches

Bulletin 152 lists and illustrates a complete line of dry-type and liquid-filled switches through 14.4 kv. Units offer Auto-Speed interruption and automatically produced interruption that occur at the same point in the switching operation and take ½ cycle. Ratings, dimensions, and specifications are given. *Electrical Engineers Equipment Co.*



72—High Voltage Insulation

Exceptional characteristics of Anaconda Type AB butyl-rubber insulation in high-voltage applications are highlighted in engineering bulletin EB-27, 12 pages. It details results of tests in which Type AB compound demonstrated unusual ozone resistance, long aging performance, and good power factor stability. *Anaconda Wire & Cable Co.*



73—Commercial Lighting Units

Catalog C, 52 pages, describes the newest, most modern lighting equipment for stores, offices, and schools. It includes such new Benjamin lighting developments as Multivent Troffers that deliver light and air conditioning from one unit; Capri luminous indirect fixtures; Sky-Liter units with four panel designs. *Benjamin Electric Mfg. Co.*



74—RLM Specifications

This new edition of the "RLM Standard Specifications for Industrial Lighting Units" includes newly revised light distribution curves on RLM direct and semi-direct fluorescent lighting units. Most important changes and additions are new coefficient of utilization tables for eight incandescent and fluorescent units. *RLM Standards Institute.*



75—Control Centers

Catalog SM-244, 16 pages, describes in detail the modern method for centralizing electrical power distribution and motor control equipment for industrial applications. It also contains suggested ideas for control specifications, and gives a simplified selector for use in control center layout and planning. *Square D Company.*



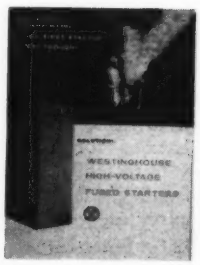
76—Ballast Reference Guide

"Advance Fluorescent Lamp Ballast Cross Reference Guide" is a handy wall chart with comparative data on lamp ballasts manufactured by Advance Transformer and other manufacturers. It matches the catalog numbers of the Advance ballasts and the catalog numbers of other manufacturers' products. *Advance Transformer Co.*



77—Dry-Type Transformers

"Latest Development in Dry-Type Transformers," eight-page bulletin 153 gives typical applications, sizes and types, construction, and specifications for air-cooled, dry-type transformers both standard and custom-built. Photos and short descriptions are included for many of the types of transformers and accessories. *Sorgel Electric Co.*



78—Fused Starters

"For industrial high-voltage systems a 'ten times starter' is not enough," according to 12-page booklet B-6535. It tells how high-voltage, fused starters give protection to the system, personnel, and motors. Horsepower ratings and representative types of starters available for a-c motors are listed. *Westinghouse Electric Corp.*



79—Planning Guide

Eight-page bulletin 10004-B gives complete information on how to plan and specify isolated phase bus for generator leads and switching stations. It contains the latest data on the new telescoping cover construction. This is a companion bulletin to comprehensive 28-page bulletin 10004-A on metal-enclosed bus. *I-T-E Circuit Breaker Co.*



80—Load-Center Distribution

Bulletin GEA-3592, 32 pages, describes advantages of using load-center distribution and compares various load-center systems. It includes complete descriptions of incoming-line equipment, transformers, and low-voltage switchgear. Tables give ratings, weights, dimensions, and application information. *General Electric Co.*



81—Fluorescent Lighting

Corralume, Corraline, and Corralouver fluorescent lighting fixtures designed for lighting corridors, pedestrian tunnels, and similar long narrow traffic areas are shown in four-page bulletin OD-639. Flexibility of application makes them suitable also for use under balconies, in reception areas, and for washrooms. *Day-Brite Lighting, Inc.*



82—Low Voltage Switchgear

Bulletin 6004-B, 12 pages, describes I-T-E low voltage metal-enclosed drawout switchgear, indoor and outdoor, incorporating type K and LG circuit breakers. Ratings are through 600 v, 6000 amp continuous, and 15,000 amp interrupting. Also included are basic standard arrangements. *I-T-E Circuit Breaker Co., Switchgear Div.*



83—Transformers and Substations

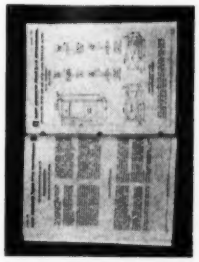
Twelve-page bulletin 655 describes construction and advantages of the Sorgel load center dry-type and Askarel-cooled transformers—units that can be installed in buildings without fireproof vaults. Substations embodying these transformers and supplied with various types of primary and secondary switchgear are discussed. *Sorgel Electric Co.*

To order personal copies of these bulletins, please fill out the card between pages 8 and 9 or 24 and 25.



84—Bus Duct Manual

"Bus Duct Manual," 72-page bulletin B-4272B, is designed for consultants' use in planning and selection of units for bus duct layout in commercial, institutional, and industrial buildings. Plug-in duct, weather-proof feeder duct, low-impedance duct, and weather-proof low-impedance duct are fully covered. *Westinghouse Electric Corp.*



85—Layout Manual

This 67-page manual, specifically intended for the consulting engineer, consists entirely of layout arrangements, bussing diagrams, conduit entrance data, description of construction and arrangement, and suggested specifications. It covers switchboards most suitable for requirements between 400 and 2000 amp. *Square D Company.*



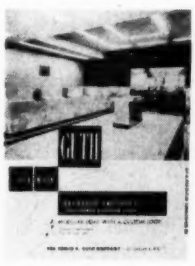
86—Underground Cable

"Cable Installation Equipment," 40-page catalog 65, covers the complete line of equipment for the installation of underground cable, including the Pneumatic Fishline to pull through all pipe cleaning mandrels, brushes, etc. "Men Working" signs, manhole guards, and racks for support in confined areas are shown. *T. J. Cope, Inc.*



87—Electrical Connectors

New four-page folder 30b/Hu presents the complete Hubbell Twist-Lock line, including Super Twist-Lock (3000 series); the Regular Twist-Lock in all sizes, types, and ratings; and Insulprene Twist-Lock rubber connector bodies. Bulletin is designed for easy reference by consulting engineers, giving ratings and dimensions. *Harvey Hubbell, Inc.*



88—Recessed Lighting Fixtures

"Guth Lite Blox Recessed Troffers," 32-page catalog 50, gives complete data on 2 x 2, 2 x 4, 2 x 8, and 4 x 4 ft fluorescent troffers with various lenses and louvers, data on round, square, and dome type recessed incandescent fixtures, and data on new models of large area lighting fixtures for various types of ceilings. *Edwin F. Guth Co.*



89—Supports

"RAKIT Supporting Structures," eight-page catalog 853, describes supporting structures for instrument tubing, and power and control cable racks. Booklet points out simplicity of construction—a twist of the wrist positions the supporting arm. Units are available with porcelain fittings. *Rakit Corp., Div. of T. J. Cope, Inc.*



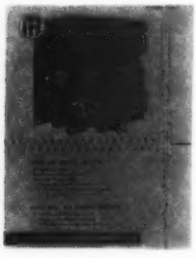
90—Corrosion-Proof Motors

"Corrosion-Proof, From Core to Cover," eight-page bulletin B-2406, outlines the special construction features of Reliance Electric corrosion-proof motors, 1 through 150 hp, 2 or 3 phase, 60 cycle, 220 through 2300 v. Protection of all internal mechanical and electrical parts is pointed out by means of drawings. *Reliance Electric and Engineering Co.*



91—Disconnectors

Bulletin 140, 36 pages, describes 3E ISOLATORS for disconnecting equipment and cables, in ratings up to 15,000 v and 1200 amp. It lists points to be considered when ordering, shows the units in typical applications, and gives dimensional drawings, cutaways, and specifications for the various types. *Electrical Engineers Equipment Co.*



92—Large Air Circuit Breakers

Six-page bulletin 1004-A describes the I-T-E, K Line circuit breakers. It includes manually and electrically operated circuit breakers to be applied as switchboard breakers, individually enclosed breakers (Urelites), and one-high individually enclosed drawout units. Data is given on heavy duty d-c breakers. *I-T-E Circuit Breaker Co.*



93—Cable and Tube Raceways

The Globetray system of cable and tube raceways engineered for uniform design and easy installation is described in this 12-page bulletin. Aluminum and steel load data are given along with illustrations of expanded metal, solid bottom, and standard types of Globetray raceways. Installation photos are included. *Globe Co.*



94—High Speed Circuit Breakers

Six-page bulletin 3004-A contains descriptive and technical information about the FB line of high speed, current limiting d-c circuit breakers. Principal applications of these breakers are for generators, motors, anode protection, and as feeder breakers. Wiring diagrams and outline drawings are included. *I-T-E Circuit Breaker Co.*



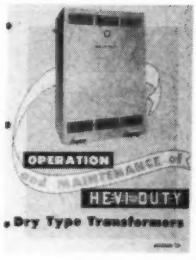
95—Dry Type Transformers

Six-page bulletin HD 499 contains descriptions, specifications, and photos of Hevi-Duty's complete line of dry type transformers for power and lighting circuits, electric furnace control, phase changing, indoor sub-stations, machine control circuits, motor starters, and other similar types of specialty uses. *Hevi-Duty Electric Co.*



96—Cathodic Protection

Cadweld connections for cathodic protection are described in four-page folder 549-2. Included are specification tables, drawings, and directions for ordering and installation of formed terminal connections and anode lead connections. How copper is welded to either copper or steel without heat is explained. *Erico Products, Inc.*



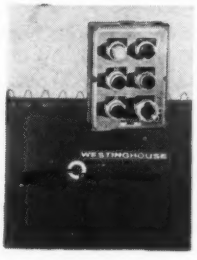
97—Dry Type Transformers

Twelve-page manual T2 has been prepared as a guide to the proper installation and maintenance of dry type transformers. It explains general characteristics, installation procedure, operation, grounding, and gives weight of core and coil units. Indications and causes of transformer failure are also discussed. *Hevi Duty Electric Co.*



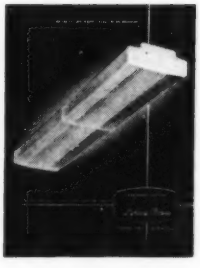
98—Interlocked-Armor Cables

A complete line of Anaconda DURALOX Interlocked-Armor Cables is described and illustrated in 16-page brochure DM-5605. Included is information relating to applications, advantages, and construction features; installation, terminating, and jointing methods. Use by utilities and industry is shown. *Anaconda Wire & Cable Co.*



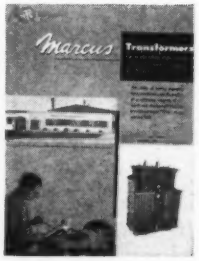
99—Pushbutton Guide

Bulletin B-6749 is a complete 76-page guide containing illustrations, application data, dimensions, and prices of a complete line of Industrial Pushbuttons. Whether the application calls for standard duty, heavy duty, Oil-tite, or special service control stations, this easy-to-read catalog will give the answer. *Westinghouse Electric Corp.*



100—Lighting Fixtures

Fluorescent and incandescent lighting fixtures for commercial and industrial installations are described and illustrated in 12-page bulletin OD-663. Installation drawings are given for use of each type of fixture with various kinds of ceilings — acoustical, plaster, and metal pan, exposed or concealed suspension. *Day-Brite Lighting, Inc.*



101—Transformer Manufacture

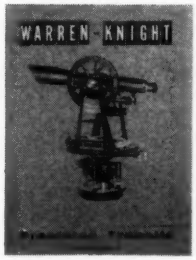
Four-page folder 55-VMT is a visual picture of a visit to the Marcus transformer plant. You are shown through the engineering, production, and shipping departments to point out the care with which each order is checked and carried out. Marcus makes a complete line of dry type and liquid-filled transformers. *Marcus Transformer Co.*

ENGINEER'S OFFICE EQUIPMENT



102—Series 2 and 4 Transits

Full size Series 2 and 4 Precision Transits are described in four-page folder 2cF-A18812. It explains how you get more for your money with a Warren-Knight, gives specifications, lists advantages of construction, lists instruments available, explains the lifetime guarantee, and offers a 10 day trial free of charge. *Warren-Knight Co.*



103—Series 7 and 9 Transits

Twenty-nine reasons why you will want a Warren-Knight Precision Transit are listed in four-page folder 7-A19482 on the Series 7 and 9 Transit. Full specifications are given, ways in which the unit helps you save time and money, lifetime guarantee, ten day free trial, accessories available, and prices are listed. *Warren-Knight Co.*

HEAT EXCHANGERS AND WATER HEATERS



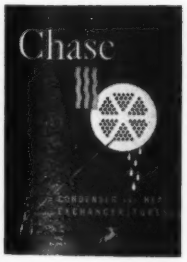
104—Heat Exchangers

Bulletin HE-6 is a 28-page pictorial presentation of standard and custom built heat exchangers, constructed from steel, non-ferrous materials, or alloys, to meet every temperature, pressure, or vacuum service in conformity to all codes. Features of design and construction are given for each type of heat exchanger. *Henry Vogt Machine Co., Inc.*



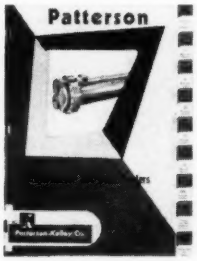
108—Heat Exchangers

Four-page brochure 585 outlines all types of shell and tube CONSECO heat exchanger equipment in all materials, for any pressure and temperature, and for every application. Each type is illustrated and described and special features pointed out. Other products by Condenser are described. *Condenser Service & Engineering Co., Inc.*



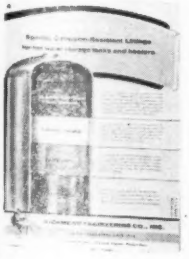
105—Alloy Tubes

Technical manual D-10, 52 pages, on condenser and heat exchanger tubes, gives a brief up-to-date discussion of corrosion problems commonly encountered in various fields. Designed to assist you in the selection of the most satisfactory alloy tube, it provides engineering data useful in specification. *Chase Brass & Copper Co. Inc.*



109—Water Heaters

Catalog 202, 36 pages, describes instantaneous water heaters and heat exchangers manufactured by Patterson-Kelley. This tab indexed reference work is a valuable aid in specifying equipment for commercial, industrial, and domestic heating systems where a continuous supply of hot water is required. *Patterson-Kelley Co., Inc.*



106—Corrosion Resistant Linings

"Special Corrosion Resistant Linings for Hot Water Storage Tanks and Heaters," four-page folder 514, describes plastic coatings and linings, cement linings, clad steel, and galvanizing for hot water storage tanks and heaters. Suggested uses for each type of lining are listed with advantages. *Richmond Engineering Co., Inc.*



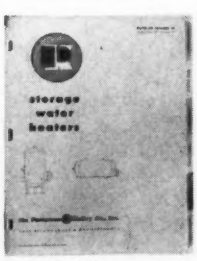
110—Hot Water Storage

"Reco Copper-Lined Hot Water Storage Tanks and Heaters," four-page folder 513, gives specifications, special construction details, and cutaway drawings of steel-shelled, horizontal and vertical copper-lined tanks and heaters. It discusses briefly the full line of fabricated heat exchange equipment. *Richmond Engineering Co., Inc.*



107—High Pressure Closures

Bulletin 5.6K1, four pages, describes high pressure closures for Ross feedwater heaters and other high pressure, high temperature exchangers. Design details are illustrated by photos and cross sections. Text discusses simplicity of design, safety factor, and ease of removal. *Ross Heat Exchanger Div. of American-Standard.*



111—Storage Water Heaters

"Storage Water Heaters," 48-page catalog 19, gives construction details, storage and heating capacities, dimension tables, and standard specifications for steel, copper-lined, copper silicon, cement-lined, clad-galvanized, and Lo-Flo storage water heaters. Typical piping diagrams are included for easy reference. *Patterson-Kelley Co., Inc.*

INSTRUMENTS AND CONTROLS



112—Air Meter

Four-page bulletin 55 describes how the Anemotherm Air Meter gives you all vital readings with pushbutton ease. It provides a simple rapid method of measuring air velocity, air temperature, and static pressure when balancing heating, ventilating, and air conditioning systems with air diffusers, registers, or grilles. *Anemostat Corp. of America.*



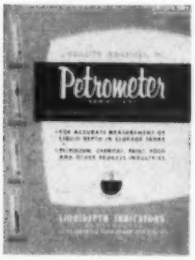
113—Liquid Level Controls

"Magnetrol Liquid Level Controls," 84-page reference catalog, gives complete information on the Magnetrol line of controls for practically any liquid, at any pressure, and at any temperature. Recommended uses for each product are explained and all specifications, dimensions, ratings, and capacities are listed. *Magnetrol, Inc.*



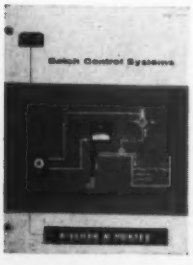
114—Bi-Color Gage

Advantages gained by use of Diamond's Multi-Port Bi-Color Gauge on new or old boilers with design pressures up to 900 psig are pointed out in four-page folder 2044: high availability, lower maintenance, shorter warm-up time, and excellent readability. Sectional views and cutaways show construction. *Diamond Power Specialty Corp.*



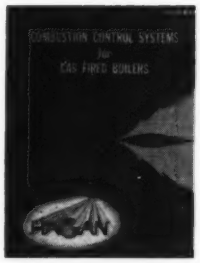
115—Industrial Tank Gages

Bulletin 6004 describes a new line of remote reading Industrial Liquid Depth Gauges. It presents comprehensive information on operation and design of the Petrometer Series 1400 Gauges, as well as on the method of selecting the right gage for remote indication of depth or quantity of liquids in tanks and pressure vessels. *Petrometer Corp.*



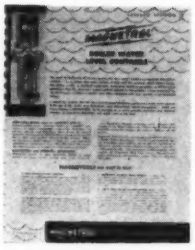
116—Batch Control Systems

"Batch Control Systems," catalog 91-19, describes Fischer & Porter's simple, dependable systems for adding a predetermined volume of fluid to a batch process. It goes into detail on how the systems operate, gives schematic wiring diagrams, and explains writing of specifications for various types of systems. *Fischer & Porter Co.*



117—Combustion Control Systems

Bulletin MSA-116, 16 pages, describes and illustrates with schematic drawings, combustion control systems for six different types of gas fired boilers. Descriptions and schematics are also included for three-element boiler drum level control and Hagan remote switching. Typical installation photos are shown. *Hagan Corp.*



118—Boiler Water Level Controls

Four-page catalog section III deals with the use of Magnetrol boiler water level controls for protection of equipment. Single stage, standard multi-stage, and combination water column and level control units are illustrated and described. Construction of each type, its characteristics, and typical applications are discussed. *Magnetrol, Inc.*



119—Liquid Level Indicators

How the Eye-Hye gage helps protect the power plant from liquid level accidents is explained in four-page catalog 500, Sec. CO. A diagram shows the flexibility of placement possible: near boiler, tank, or other vessel, or on instrument panelboard, near by or considerably removed from the boiler. *The Reliance Gauge Column Co.*



120—Remote Reading Gages

"You Can Check the Liquid Level From Anywhere in the Room," eight-page bulletin 246, covers the three standard types of Convex Scale and Flat Scale Truscale Remote Reading Gages, showing how they afford protection for valuable equipment and thus prevent expensive and time consuming shutdowns. *Jerguson Gage & Valve Co.*



121—Motor Control

Consulting engineers who specify motors and controls will find 40-page booklet, "Motor Control, Theory and Practice," 14X7988, an excellent source of up-to-date information. It discusses the theory and application of starters for squirrel cage, wound rotor, and synchronous motors and control functions. *Allis-Chalmers Mfg. Co.*



122—Liquid-Level Alarms

A series of four Levalarms, liquid level alarms and fuel cut-outs, is described in four-page bulletin D2. The bulletin explains principle of operation — water conduction between electrodes of varying lengths—how the units can be used with relays to provide alarm actuation, fuel cut-out, or pump start-stop control. *The Reliance Gauge Column Co.*



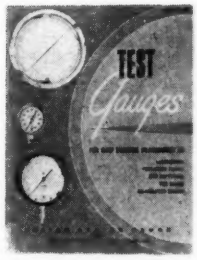
123—Heating and Cooling Controls

Mercoid automatic controls for heating, refrigeration, air conditioning, and industrial applications are described in 56-page catalog 857. The booklet is completely indexed by subject and catalog number and gives all pertinent engineering data, specifications, dimensions, ranges, and temperature and pressure charts. *The Mercoid Corp.*



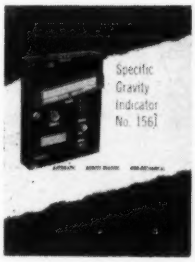
124—Power Positioners

"Muscles for Industry" is a series of specification sheets covering all Hagan linear power operators from the 4 x 5 in. size up to 12 x 48 in., as well as diaphragm type operators. Complete information is given on each operator, including performance and construction specifications and dimensional diagrams. *Hagan Corp.*



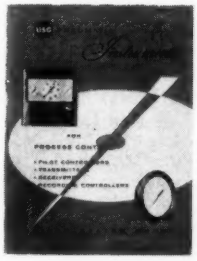
125—Test Gage Catalog

Eight-page bulletin 400 deals with selection of test gages for fluid pressure measurement in laboratories, production testing, field inspections, test stands, and recalibration benches. It provides a list of check points for ordering gages, and suggests applications for each. *U. S. Gauge, Div of American Machine and Metals, Inc.*



126—Specific Gravity Indicator

Four-page technical bulletin 7004 describes the operation, design, and construction of the new remote reading Specific Gravity Indicator 1561, an automatic, direct reading, non-mechanical instrument, accurate to 0.001 unit of specific gravity. Easy installation and maintenance features are illustrated and discussed. *Petrometer Corp.*



127—Process Control Instruments

Catalog 505, 16 pages, on pneumatic instruments for process control, discusses indicating pilots, transmitters, and receiver gages. The new 3½ in. Scanning Diaphragm Receiving Gauge with rotatable dial is described and illustrated. Ordering data, dimensions, and typical dial faces are given. *U. S. Gauge, Div. of American Machine and Metals, Inc.*

MATERIALS HANDLING AND STORAGE



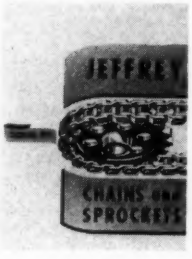
128—Bulk Materials Handling

Dravo equipment for handling bulk materials — ore and coal bridges, man trolley unloaders, replacement trolleys, rope operated towers, and hydraulic buffers and rail clamps — are illustrated and described in 32-page bulletin 225. Elevation drawings and features of construction are given for each type. *Dravo Corp.*



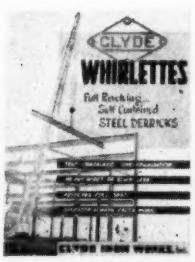
129—Tractors

"The D9 in Action," eight-page booklet, describes the wide acceptance gained by this powerful tractor during its first year. Pictured are application shots of the D9, working on a full range of jobs, under all working conditions. Performance on stockpiling, pioneering access roads, and logging are pointed up. *Caterpillar Tractor Co.*



130—Chains and Sprockets

Catalog 899, a 224-page book, is a complete catalog of Jeffrey chains and sprockets. It goes into detail on the specification and planning of layouts with subjects such as chain metals, chain selection, speed factors, horsepower ratings, working values, weights, hub selection, and similar factors to be considered. *Jeffrey Manufacturing Co.*



131—Steel Derricks

Advantages gained by using Whirlettes — full revolving, self contained steel derricks — are listed in four-page folder MP-49. The hoist is mounted on the rotating structure and only one foundation is necessary. No guy lines or stiff legs are required. Booklet gives specifications, and illustrates typical uses. *Clyde Iron Works, Inc.*



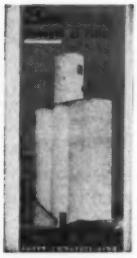
132—Automatic Feeders

Bulletin 253, 16 pages, discusses the application of the Merrick Model WS Feedoweight — a self-contained automatic, continuous gravimetric feeder for blending, proportioning, or feeding of granular materials to process by weight. Specifications, drawings, and capacities are given for left and right-hand assembly. *Merrick Scale Mfg. Co.*



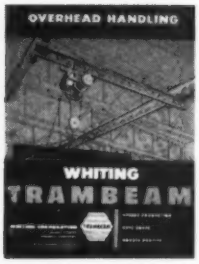
133—Tubular Conveyors

This new catalog presents numerous examples of the use of Hapman Tubular Conveyors in all types of industries for moving flowable materials — wet and dry — through any plane or angle. Weight-volume-time conversion chart, conveyor capacity chart, suggested applications, and specifications are given. *Hapman Conveyors, Inc.*



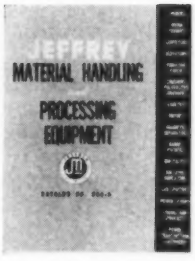
134—Storage Bins

If you specify vertical storage construction for handling flowable bulk materials, this ten-page foldout will help you visualize how this company's Super-Concrete Stave Storage Bins might meet your requirements. The booklet contains photographs of typical installations, lists uses, and explains construction. *The Neff & Fry Co.*



135—Overhead Handling Systems

Trambeam, an overhead handling system available in either monorail or crane systems and designed to handle loads up to 15 tons, is described in 20-page bulletin M-20. Motor-driven, electric hoist, and cab-operated carriers are shown. Special features such as the flexible suspension are discussed and pictured. *Whiting Corp.*



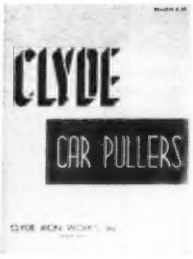
136—Materials Handling

Catalog 860-A, 46 pages of general information on material handling and processing equipment, gives the reader a quick picture of the broad Jeffrey line. Manufacturing facilities, data, and a reference guide are included for the various products, along with drawings and numerous views of modern installations. *Jeffrey Manufacturing Co.*



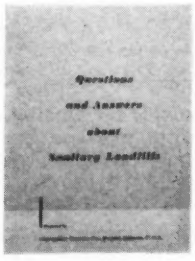
137—Industrial Storage Silos

"Modern Industrial Storage Systems," 12-page brochure 4393, discusses the subject of storage for raw ingredients, semi-processed, or finished material. The flexibility and adaptability of concrete silos is discussed. Descriptions of component parts and construction are supplemented with line drawings. *The Marietta Concrete Corp.*



138—Car Pullers

Ten-page bulletin L-6 shows capstan type car puller for moving cars a short distance using manila rope. Three styles of drum car pullers for heavy duty car moving, shuttle work, or for servicing very large areas are also listed, as well as barge movers for shifting barges back and forth during unloading. *Clyde Iron Works, Inc.*



139—Sanitary Landfills

"Questions and Answers About Sanitary Landfills," 20 pages, answers 19 specific questions, compares various landfill methods, tells how to approach each, and how much land is required for a successful operation. An equipment selection guide shows the equipment necessary for towns up to 60,000 population. *Caterpillar Tractor Co.*



140—Electric Hoists

Featured in four-page bulletin H-44 is the complete line of P & H electric hoists, including condensed specifications and specially prepared cutaway photos of the complete Hevi-Lift and Zip-Lift Hoist Line. The new P & H control cabinet, redesigned to better meet users' needs, is described in detail. *Harnischfeger Corp.*



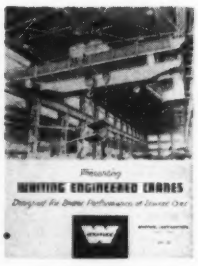
141—Conveyor Scales

"Weight at a Glance," 22-page bulletin 375, contains complete specifications, drawings, and illustrations of the Merrick Model E Weightometer — a fully automatic conveyor scale for continuous weighing of material passing over an existing belt conveyor. Other types of automatic weighing machines are described. *Merrick Scale Mfg. Co.*



142—Stepless Crane Control

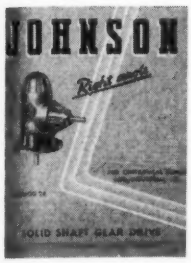
Principles of operation of the new P & H electronic stepless control for overhead traveling cranes are discussed in four-page bulletin C-53. Applied in conjunction with the standard P & H Magnetorque, this control is said to provide an ultimate in control and precision spotting in both lowering and hoisting. *Harnischfeger Corp.*



143—Cranes

Twelve-page catalog 80 explains how your client gets low cost handling with Whiting engineered cranes. Such features as Selectodyne control, full vision cab, and Timken tapered roller bearings are described. Photos show the cranes in use in foundry yards, in steel mills, in diesel repair shops, and in power plants. *Whiting Corp.*

MECHANICAL POWER TRANSMISSION



144—Right Angle Gear Drives

Right angle solid shaft gear drives, for centrifugal pumps and industrial use — cooling tower installations, barge service, sewage disposal, fire and flood control — manufactured in a wide range of models to meet specific requirements, are described and illustrated with engineering details in eight-page catalog 28. *Johnson Gear & Mfg. Co.*



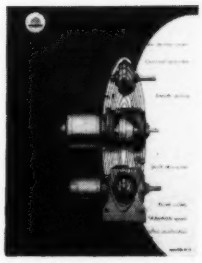
145—Flexible Gear Couplings

Advantages and typical applications of flexible gear couplings are pictured and described in 16-page catalog C-4, "The Revolutionary New Sier-Bath Flexible Gear Couplings." Couplings are available in standard, vertical, mill-motor, floating shaft and spacer type, and in many special purpose types. *Sier-Bath Gear & Pump Co., Inc.*



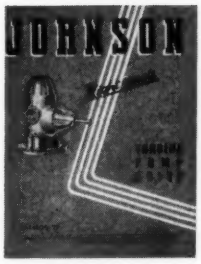
146—Clutches

The Electro Clutch, developed to connect or disconnect a driven shaft or gear from a driving shaft that is either running or standing still, is described in four-page bulletin ECP-656. Photos show the units in typical industrial applications where many output speeds are desired. *I-T-E Circuit Breaker Co., Transformer-Rectifier Div.*



147—Fluid Drives

Sixteen-page bulletin 9119 covers Gyrol Fluid Drives for ½ to 25 hp applications, types T, TM, and VS Class 2 for industrial use in the low horsepower range. Typical performance curves compare starting torque, starting current, and heat generation of a general purpose a-c motor with and without fluid drive. *American Blower Corp.*



148—Turbine Pump Drives

Right angle turbine pump drives, in standard and combination drive installations and available in a wide range of models to meet specific requirements of high or slow speed prime movers and pumps, are described and illustrated in nine-page catalog 27. Tables and charts show power ratings and average efficiencies. *Johnson Gear & Mfg. Co.*

To order personal copies of these bulletins, please fill out the card between pages 8 and 9 or 24 and 25.

PIPING, VALVES, AND SPECIALTIES



149—Plumbing Drainage Products

Catalog 34, "Build Better with Boosey," gives specifications, dimensions, suggested applications, drawings, and engineering data on a complete line of plumbing drainage products. It covers back water control valves, grease interceptors, floor and shower drains, roof drains, vacuum breakers and fixed air gaps. *Norman Boosey Mfg. Co.*



150—Solder-Joint Fittings

"Engineers' Handbook," 46 pages, gives you complete roughing-in dimensions of solder-joint fittings available for all types of installations using copper water tube and fittings. It lists types, sizes, weights, diameters and tolerances, working pressures, solders, friction losses, specifications, and gives flow charts. *Chase Brass & Copper Co., Inc.*



151—Solder End Valves

Two-page circular 603 details sizes, dimensions, types, and features of Solder End Globe, Gate, and Check Valves, particularly suited for steam, hot, and cold water lines; heating and air conditioning systems; oil, natural, and manufactured gas lines; underground water lines; and industrial use. *The Lunkenheimer Co.*



152—Mixing Valves

OPW-Jordan automatic temperature control mixing valves to overcome the effects of fluctuating temperature in photographic developing tank solutions and rinse water are described in four-page folder J-100. Construction, operation, and specifications are given for valves and accessories. Cross sections show internal parts. *Jordan Corp.*



153—Line Expansion

A simple method of determining approximate thermal expansion stresses in Z, L, and U bends and in expansion loops is presented in 12-page bulletin TT 809. A calculation form; table of expansion factors and allowable stress range; and table of effective diameters and lengths are included. *Tube Turns, Div. of National Cylinder Gas Co.*



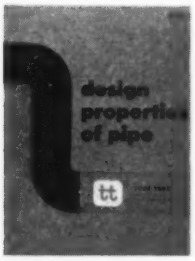
154—Packless Diaphragm Valves

The expanded line of Crane packless diaphragm valves, now available in a new wide choice of body, disc insert, and diaphragm materials, in unlined or lined patterns, is described in 24-page bulletin AD 1942. Tables indicate services for which each type of valve is suitable, including use with corrosive and noncorrosive fluids. *Crane Co.*



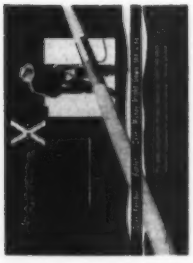
155—Underground Pipe Insulation

"Gilsulate . . . The Triple-Zone Insulation," four-page bulletin, gives tips on the uses and installation of the new insulation for hot underground pipes. It explains how the material protects pipes against corrosion caused by acid and alkaline ground waters, and against bacterial action, roots, and electrolysis. *American Gilsonite Co.*



156—Design Properties of Pipe

"Design Properties of Pipe," ten-page bulletin TT 330, presents in table form all the dimensional data needed to determine wall thicknesses required to resist internal pressure, bending stresses resulting from line expansion or caused by weight loadings, and column sizes required to sustain loads. *Tube Turns, Div. of National Cylinder Gas Co.*



157—Pipe Protection Tape

Tapecoat-X, the coal tar coating in tape form for single-wrap application, is described in this four-page bulletin. Illustrations and data point up economies in time, material, and labor resulting from extra thickness of coal tar available for protecting pipe, pipe joints, fittings, couplings, and tanks. *The Tapecoat Co.*



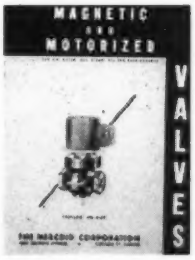
158—Jointed Clay Pipe

Jointed vitrified clay pipe known as Amvit, with a built-in mechanical joint made from polyvinyl chloride is described in four-page folder. Advantages such as infiltration prevention, quick installation, immediate backfilling, better flow, shock absorption, and quick testing in the field are pointed out. *American Vitrified Products Co.*



159—Lubricated Plug Valves

"Powell Lubricated Plug Valves," 36-page catalog PV-4, shows in detail the complete line of iron and steel lubricated plug valves available. Photos and sectional and detailed drawings are given for single, screwed, and bolted gland type valves. Also included are physical data on dimensions and ratings. *The Wm. Powell Co.*



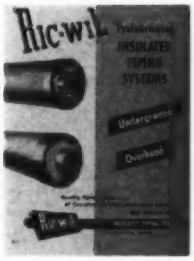
160—Valves

Twenty-page catalog V-55 covers magnetic and motorized valves for air, water, gas, steam, oil, and refrigerants. It includes specifications, sizes, capacities, and suggested applications for each type of valve, flow charts for liquids and compressible fluids, tables of dimensions, and other engineering data. *The Mercoid Corp.*



161—Gate Valves

Four-page bulletin 1006 describes the new and complete line of 125, 150, and 200 psi capacity union bonnet bronze gate valves. Also described is the new alloy 40 stem with an increased life of 20 to 30 times that of ordinary stems, and the long lasting copper nickel alloy wedge. Specifications and dimensions are given. *The Ohio Injector Co.*



162—Insulated Piping

"Prefabricated Insulated Piping Systems," 24-page bulletin 56-1, shows typical uses for Hel-cor pipe units for underground or overhead pipe systems, and for Utilidor conduits for protection of underground utility services. Sample specifications are given, along with conduit sizing charts and trenching dimensions. *Ric-wiL, Inc.*



163—Diaphragm Valves

New 12-page catalog 100 describes Hills-McCanna diaphragm valves in terms of their advantages, applications, and specifications. The three basic types of valve operation are shown in cross sectional views, and dimensional specifications are given. Information is included on plastic bodies and diaphragms. *Hills-McCanna Co.*



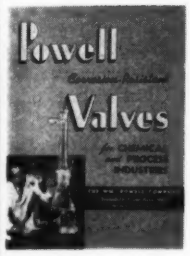
164—Valve Manual

Forty-page catalog B-2 is designed to help engineers select valve types, understand their characteristics, and determine space requirements. It includes such useful data as: pressure drop and flow tables, conversion tables, theory and application, recommended materials, and describes Pratt valves and operators. *The Henry Pratt Co.*



165—Piping Fittings

General catalog 55, 304 pages, presents detailed dimensional data and specifications on a complete line of seamless welding fittings and forged fittings. It includes a 56-page technical data section featuring allowable stress and P/S tables and maximum working pressure charts. Catalog is tab indexed for quick reference. *Ladish Co.*



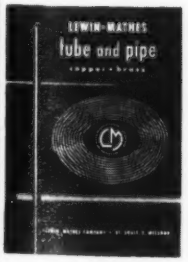
166—Corrosion-Resistant Valves

"Powell Corrosion-Resistant Valves for Chemical and Process Industries," form 166, gives features of construction, photographs, and sectional drawings of valves of every design, to meet almost every flow-control requirement. The large selection of metals and alloys in which they are available is listed also. *The Wm. Powell Co.*



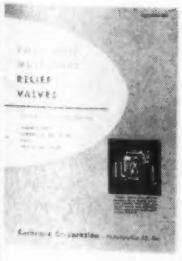
167—Drop Forged Fittings

The new drop forged Bonney Elbolets with full penetration weld are described in this catalog sheet. Applications for directional flow branches, Thermowell connections, and pipe support and hanger connections are discussed. These fittings are available from stock in carbon steel, stainless steel, and chrome moly. *Bonney Forge & Tool Works.*



168—Tubing and Piping

This 12-page bulletin lists each type of Lewin-Mathes copper and brass tubing and piping with the temper, lengths, fittings, uses, and specifications. Sizes and capacities are in table form to aid in selection. Photos show use for water piping, air conditioning, heating, underground service and drainage lines. *Lewin-Mathes Co.*



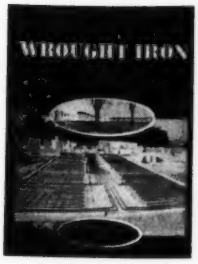
169—Multiport Relief Valves

Publication 5200 describes the Cochrane Relief Multiport Valve for safety and regulation of line overpressure applications. It includes detail drawings of various types, tables of standard sizes, basic sizing, and application data. Advantages over single port pressure relief valves are discussed in some detail. *Cochrane Corp.*



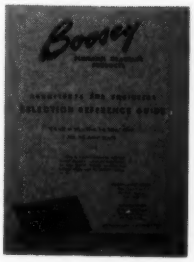
170—Pipe Vibration

The plague of oscillation set up in pipe lines during pumping of compressible gases is costing industry millions of dollars yearly through inefficiency and pipe system maintenance, according to booklet, "Bouncing Pipes," which deals in detail with the cause, effect, and remedy of this engineering problem. *Burgess-Manning Co., Snubber Div.*



171—Wrought Iron for Heating

"Wrought Iron for Radiant Heating," 52-page technical bulletin, presents a cross-section of modern thought on the subject of radiant heating as gathered from recognized authorities in the field. The book covers history and theory, advantages, comparative cost, calculation and design of a system, and pictures of typical installations. *A. M. Byers Co.*



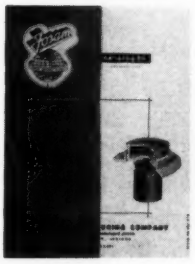
172—Drains

Six-page "Selection and Reference Guide" contains brief suggested specifications for use in setting up standard consulting engineers' specifications. It gives complete information on which Boosey drain to select for each location. Data is taken from recent installations in which these products were used. *Norman Boosey Mfg. Co.*



173—Bonnet Valves

Pressure-seal bonnet valves for high-pressure, high-temperature power plant service and for use in industrial and chemical plants are described and illustrated in 16-page bulletin AD-1936. Sizes, list prices, and dimensions are listed in tables, along with information on determining proper size and pressure drop. *Crane Co.*



174—Cleanouts and Covers

"Superseal Cleanouts and Access Covers," 18-page catalog CL, gives typical installation methods, dimensions, installation diagrams, and suggested locations. Each item is illustrated and described and specifications are given. Materials and finishes available are listed and typical code requirements are discussed. *Josam Mfg. Co.*



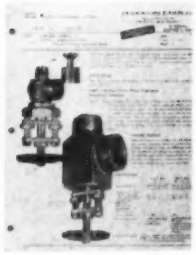
175—Impulse Steam Traps

The new Series 40 Yarway Impulse Steam Trap, designed for use where condensate must be handled in unusually large quantities, is described in four-page bulletin T-1746. It pinpoints applications, and gives full information on capacities, sizes, materials, weights, construction features, and method of operation. *Yarnall-Waring Co.*



176—Power and Process Piping

"Harnessing the Energy of Steam" describes research, metallurgy, engineering, fabrication, and erection of high temperature, high pressure ferritic and austenitic alloy piping for central station, industrial, nuclear energy, and processing plants. Quality control and test methods are given. *Pittsburgh Piping and Equipment Co.*



177—Drain and Sampling Valves

The new Jerguson No. 23 drain or sampling valve with outside screw and yoke construction is featured in catalog sheet No. 270. Self draining principle, fool-proof construction, and optional features are explained. Complete specifications are given along with drawings showing dimensions and construction. *Jerguson Gage & Valve Co.*



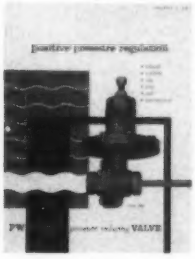
178—Pipe Insulation Manual

"Technical Data Manual," 20-page booklet, is designed to give engineers all available information on the application of Gilsulate, a new insulation for hot underground pipes. It describes the three grades, how to determine ditch size for various pipes and types of soil, and gives sample problems. *American Gilsonite Co.*



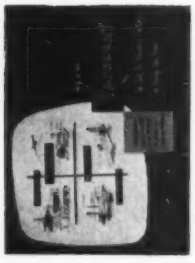
179—Lagging Adhesives

Swift's lagging adhesives for heating and process piping, and the 12 important advantages that they offer, are described in four-page folder 9283. They are recommended for bonding shells of molded insulation to themselves or pipes; as binder for loose insulation; and to adhere and size lagging cloth. *Swift & Co., Adhesives Products Dept.*



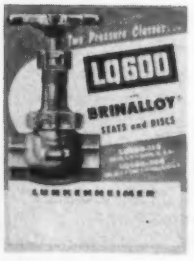
180—Pressure Reducing Valves

The eight points of superiority of the OPW-Jordan pressure reducing valve are outlined in four-page folder J-160. For use with steam, water, oil, gas, air, and chemicals, these valves can be furnished in bronze or cast iron from stock, or in monel or opalumin on special order. Construction is shown in cross sections. *Jordan Corp.*



181—Pipe Protection

"Where to Use Tapecoat," eight-page bulletin, presents applications and data on Tapecoat coal tar coating in tape form for double-wrapping on pipe, pipe joints, mechanical couplings, conduit, cable and insulated piping, above and below ground. It includes table of coverage for various sizes and presents case histories. *The Tapecoat Co.*



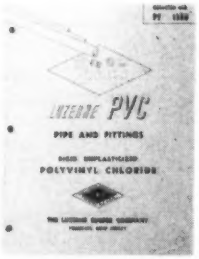
182—Bronze Globe Valves

Four-page circular 602-2 describes the two pressure classes of LQ600 Bronze Glove Valves with patented Brinalloy seats and discs. It details features and sizes of the original Fig. LQ600-150 valve, rated at 150 lb SP, 30 lb WOG; and the new Fig. LQ600-200 valve, rated at 200 lb SP, 550 F, 400 lb WOG. *The Lunkenheimer Co.*



183—Swimming Pool Drainage

"Swimming Pool Drainage Products," 32-page manual SP-5, presents drawings of typical pool systems in use in various parts of the country as an aid in preparation of complete plans for modern pools. Diagrams and schedules of materials for various styles and sizes of swimming and diving pools are included. *Josam Mfg. Co.*



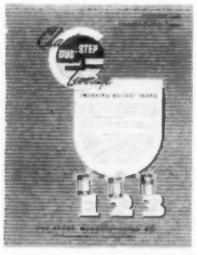
184—PVC Pipe and Fittings

Bulletin PF 1100, eight pages, presents a list of applications for PVC pipe and fittings where corrosion resistance, nontoxicity, and noncontamination are required. Mechanical, electrical, thermal, and miscellaneous properties of both normal impact and high impact PVC products are in table form for easy reference. *The Luzerne Rubber Co.*



185—Corrugated Sewer Pipe

This 44-page manual on Armco sewer structures covers the need for better sewers; structural durability of corrugated metal pipe; material durability; selection of structures; factors influencing capacity; joints and fittings; linings for failing sewers; installation and design data; and reference data. *Armco Drainage & Metal Products, Inc.*



186—Inverted Bucket Traps

Clark Inverted Bucket Traps equipped with Duo-Step leverage are shown in four-page catalog section 230. Full specifications and details are given and cover a range of operating pressures up to 1000 psig and temperatures to 850 F. Proper steam trap can be selected by referring to tables showing continuous flow capacities. *The Clark Mfg. Co.*



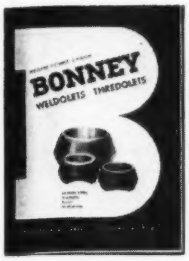
187—Gate Valves

"2 New Forged Steel Gate Lines," four-page bulletin 195-R, details the outstanding features of the 1100 Series Standard Flow and the 1300 Series High Flow valve. A trim chart and a pressure-temperature chart are given along with an exploded view of the valve, a table of general dimensions, and specifications. *The Ohio Injector Co.*



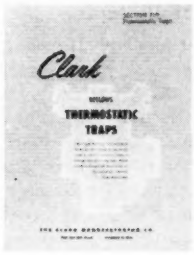
188—Expansion Joints

A new improved Type W Gun-Pakt Expansion Joint is completely described in eight-page bulletin EJ-1915 which points out that all of the outstanding features of the Yarway Gun-Pakt Joint have been retained and incorporated with a new one-piece body and gland that permits several important advantages. *Yarnall-Waring Co.*



189—Fittings

This bulletin illustrates when and where to use Weldolets, Thredolets, and Socket Weldolets. Specific areas of application are shown with correct installation procedure. It describes the complete range of stainless, alloy, and nonferrous fittings and Bonney's new marking standard. *Welding Fittings Div., Bonney Forge & Tool Works.*



190—Thermostatic Traps

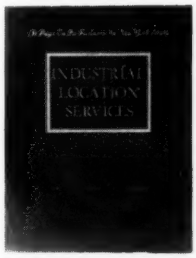
Clark Bellows Thermostatic Traps presented in catalog section 710 are of cast semi-steel, cast steel, or cast brass construction with either bronze or monel bellows. Each trap is equipped with an orifice that operates over entire pressure range. Continuous discharge capacities from 5 to 100 F temperature differential. *The Clark Mfg. Co.*

PLANT SITE SELECTION



191—New York State Map

"Physical Map of New York State and Adjacent Areas," full color wall map, suitable for framing, 3½ x 2½ ft, gives major highways, single and multiple track railroads, short line rail distances between cities, and other data pertinent to questions your clients will ask about locating in New York State. *New York State Dept. of Commerce.*



193—Location Services

"Industrial Location Services," eight-page bulletin, is designed to acquaint you with the scope and character of this service offered by the New York State Department of Commerce. It discusses information available on raw materials, transportation, markets, labor, power and fuel, water, and sites. *New York State Dept. of Commerce.*



192—Colorado Site Facts

Documented facts about sites, power, labor, raw materials, markets, transportation, climate, taxes, and living conditions are contained in the booklet, "An Analysis of Industrial Colorado and Its Potential for Industrial Development." Booklet is in loose-leaf form so that it can be kept up to date easily. *Colorado Dept. of Development.*

To order personal copies of these bulletins, please fill out the card between pages 8 and 9 or 24 and 25.

POWER EQUIPMENT & FUELS



194—Blowers

"You Clean Boilers Better and at Lower Cost with Diamond Blowers," 14-page bulletin 2111, details construction features of the Series 300 IK Long Retracting Blowers. It describes the stationary gear motor drive, motor and control terminal facilities, valves, nozzles, carriage drive, and accessories. *Diamond Power Specialty Corp.*



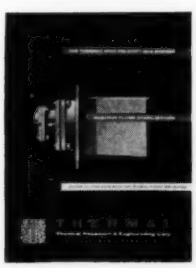
196—Heavy Duty Engines

"The W-9 Engine," four-page catalog S-500-B62, illustrates and describes construction features and gives ratings for six and eight cylinder engines operating at 900 and 1000 rpm. Included is a cutaway detail drawing of the Jet-Swirl design incorporated in the intake manifold. Specifications are given. *Worthington Corp.*



195—Water Tube Generators

Water tube Type D Superior steam generators with capacities up to 50,000 lb steam per hour are described in eight-page bulletin. With the literature comes a 12-page folder of specifications prepared to aid consulting engineers in selection, evaluation, and specification of water tube packaged units. *Superior Combustion Industries, Inc.*



197—Gas Burners

The Thermal high velocity gas burner, available in two types—standard square tile block and the shell type—are presented in four-page bulletin 106-A. Such features as a heat release rate of over 10 million Btu per hr per cu ft of combustion volume, high exit velocity, and positive flame stability are listed. *Thermal Research & Engineering Corp.*



198—Modern Coal Installations

"More and More Firms are Burning Coal the Modern Way," 20-page brochure, covers case histories of coal burning installations in new construction and in older plants that have been modernized. Data sheet is given for each installation, listing the equipment, location, and the consulting engineer. *Bituminous Coal Institute.*



199—Convertible Package Boilers

Water tube package units that can be converted to coal firing during periods of oil or gas fuel shortages are described and illustrated in eight-page bulletin 600. Design and construction features, burner equipment for various fuels, standard and optional panel board equipment, and tests are discussed. *International Boiler Works Co.*



200—Vertical Unit Boilers

More than 25 years of development, manufacturing, and application experience are reflected in the design of the Type VU-10 vertical-unit boiler described in 16-page bulletin VU-10-8. Advantages and design features are discussed. Possible installations are shown by photographs and cross sections. *Combustion Engineering, Inc.*



201—Condenser Expansion Joints

Discussion of expansion problems of turbine exhausts with special reference to modern, large or twin condensers is presented in this four-page bulletin. It shows construction of the Henry Pratt Rubber Belt Expansion Joint, and details advantages, such as simplified engineering of piping and temperature tolerance. *The Henry Pratt Co.*



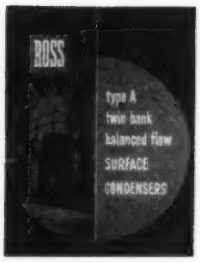
202—Diesel-Electric Power

Four-page pamphlet 105M56TCP provides specifications, performance, and fuel consumption curves for diesel-electric power systems for use in various petroleum and industrial applications, including power systems for oil well drilling, and stationary and mobile electric power units. *Electro-Motive Div. of General Motors Corp.*



203—Diesel and Dual-Fuel Engines

A complete catalog containing 60 pages describes diesel and dual-fuel engines (including sewage gas engines) ranging from 100 to 2150 hp. Engines are available with speeds to suit a wide range of fixed or skid-mounted engine applications. Cross sections and graphs give engineering data. *White Diesel Engine Div., The White Motor Co.*



204—Surface Condensers

Twin Bank Balanced Flow design surface condensers — complete description, design details, exclusive features, and numerous photos of public utility and industrial power plant installations — are presented in 32-page bulletin 8.2K1. Details of Single Bank Balanced Flow design are in bulletin 8.1K1. *Ross Heat Exchanger Div. of American-Standard.*



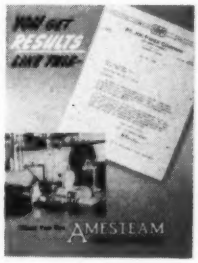
205—Packaged Boilers

The Dutton EconoTherm boiler has everything you're looking for in a compact, automatic packaged boiler, according to four-page bulletin ECA-1054. In sizes from 300 hp, the units feature modern welded boiler shell, stainless air ring, rotary combustion, and induced mechanical draft. *Dutton Boilers, Div. of Hapman-Dutton Co.*



206—Induced Fan Bifurcators

This 20-page catalog, DB-44-56, tells about the DeBothezat Induced Draft Bifurcator for providing constant boiler draft. It simplifies analysis of induced fan requirements and gives, for the first time, all manufacturers' boiler code ratings reduced to their common relationship of Btu per hr delivered to the steam. *DeBothezat Fans Division.*



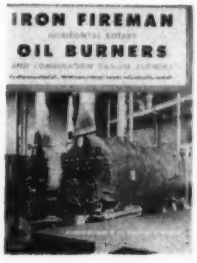
207—Packaged Boilers

New four-page bulletin GB-1 describes savings made by installation of Ames packaged boiler. Typical installations show how low installation costs, low maintenance, fewer wearing parts with longer life, and high efficiencies have benefited users, and how Amesteam Generators can reduce any boiler room cost. *Ames Iron Works, Inc.*



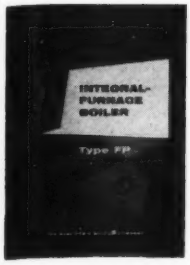
208—Deaerators

Eight-page bulletin 1300 contains all pertinent data on the Schaub ".03" Deaerator, its fully vented design and its completely different principle of operation. Capacities and applications are covered, as well as a complete description of the system itself, including inhibitor and dispersion heater tubes. *Fred H. Schaub Engineering Co.*



209—Oil and Oil-Gas Burners

A variety of oil and combination gas-oil burners are included in illustrated 24-page bulletin 5629. It describes rotary oil burners, firing units with integral air registers, complete package units with factory control panels. The Oil Volumeter that provides steady, uniform oil flow with any grade of oil is shown. *Iron Fireman Manufacturing Co.*



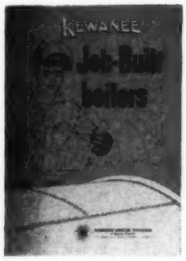
210—Integral-Furnace Boiler

Sixteen page bulletin G-83 describes the B&W Integral-Furnace Boiler, Type FP—a self-contained unit designed for power, process, or heating loads requiring steam capacities in the range of 30,000 to 80,000 lb per hr. The boiler is available for pressures between 160 and 800 psi in standard increments. *The Babcock & Wilcox Co.*



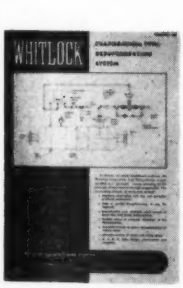
211—Emergency Electric Power

"Power Points Digest, Vol. II, No. 3, 12 pages, is devoted to the application of Onan emergency generating plants in six different hospitals. Brief descriptions cover the electrical characteristics of each emergency unit and explain the typical installation features that assure the user reliable emergency power. *D. W. Onan & Sons, Inc.*



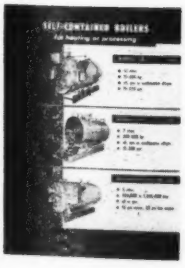
212—Commercial Boilers

"Job-Built Boilers," four-page catalog 511, illustrates and describes Kewanee's Scotch and Firebox Type Boilers which can be moved into existing boiler rooms through available doors and passageways. These commercial size boilers are delivered in sections and then assembled — for schools, hotels, etc. *Kewanee Boiler Div. of American-Standard.*



213—Desuperheaters

Bulletin 150 explains the advantages of using low pressure, low temperature equipment in high pressure steam generating plants, and describes the evaporative type desuperheater now available as a packaged system. Operating characteristics are given for desuperheaters ranging from 8000 to 150,000 lb per hr steam input. *Whitlock Mfg. Co.*



214—Packaged Boilers

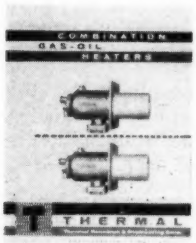
Self contained boilers for heating or processing are illustrated and described in eight-page bulletin AD 137. Boiler room layouts, plans, and dimensions are included for three models: Model CB, 15-200 hp, 15-250 psi; Model LR, 200-600 hp, 15-250 psi; Progress Boiler, 500,000 to 1,340,000 Btu, 15 psi steam, 30 psi hot water. *Cleaver-Brooks Co.*

To order personal copies of these bulletins, please fill out the card between pages 8 and 9 or 24 and 25.



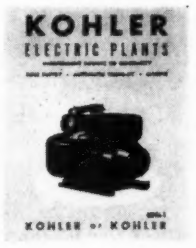
215—Packaged Boilers

Bulletin BA-256, four pages, presents in table form complete design specifications for Continental automatic boilers with 100 to 500 hp ratings with modulating control. The bulletin illustrates and describes advantages and features of the design. Boilers fire No. 2, 5, and 6 oil and/or gas. Specifications given. *Boiler Engineering & Supply Co., Inc.*



216—High Velocity Burners

New bulletin 109, "Combination Gas-Oil Heaters," covers the operating principles and application of high velocity gas or oil burners. Flame characteristics, the bulletin points out, are identical whether gas or oil is used as the fuel. Dimensional data and output curves are given for all standard models. *Thermal Research & Engineering Corp.*



217—Electric Plants

Catalog KEP56-1, 24 pages, shows the line of Kohler electric plants used as an independent source of electricity for sole supply and for automatic standby when central station power fails. Sizes range from 500 w to 50 kw, gasoline and diesel. Battery charging units in 6, 12, 36, and 140 v capacity are described. *Kohler Co.*



218—Zero-Oxygen Deaerators

Bulletin 575, eight pages, fully describes the new fully vented Schaub Zero-Oxygen Deaerator, which is guaranteed to effectively remove oxygen down to .005 cc per liter. The "whys" and "hows" of deaeration are covered as are the descriptions of all component parts used in conjunction with the system. *Fred H. Schaub Engineering Co.*



219—Spiral-Wound Gaskets

General catalog, 28 pages, tells about the development of the original spiral-wound gasket and its present applications in aviation, atomic research, process industries, power plants, and ships of the Navy and Merchant Marine. It also lists various metals and fillers used in the manufacture of these gaskets. *Flexitallic Gasket Co.*



220—Diesel-Dual Fuel Engines

This complete file, on industrial diesel and dual fuel engines of 215 to 1025 hp range, continuous service, describes White Diesel Engine Division's heavy duty units for generating sets, large power shovels, sewage plants, compressor drives, pipelines, dredge pumps and similar services. *White Diesel Engine Div., White Motor Co.*



221—Packaged Boilers

How Superior's four-pass boiler design lowers steam costs is explained in 20-page booklet. Rotary burner, gas burner, controls, and built-in induced draft feature are each described. Cutaway drawing shows path of combustion gases through the four passes. Data and dimensions are presented in table form. *Superior Combustion Industries, Inc.*



222—VP Package Boilers

Catalog P391, 16 pages, describes the new Type VP package boiler. Following a section of background information is an outline of principal design features. These boilers are shop assembled and provide steam capacities from 4000 to 42,000 lb per hr. Space requirements and specifications are in table form. *Combustion Engineering, Inc.*



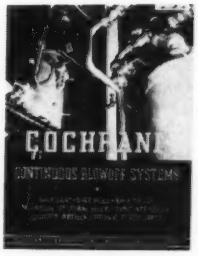
223—Low Cost Smoke Elimination

"Smoke Is Wasted Fuel," four-page bulletin, describes the Canton Turbo-Aire System of overfire air jets that ends smoke nuisance by maintaining complete combustion at the source of trouble. Simplicity, ease of installation, and low first cost and operation are pointed out. Plans and chart are included. *Canton Stoker Corp.*



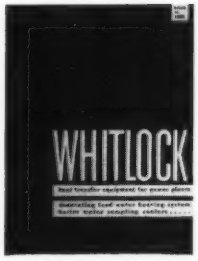
224—Emergency Service Plants

Vol. II, No. 1 of "Power Points Digest" is devoted to the application of Onan Electric Plants in emergency service. How Mercyville Sanitarium relies on a 35,000 w plant is described and illustrated along with examples of the units in use at a state police station, in a hospital, in factories, and office buildings. *D. W. Onan & Sons, Inc.*



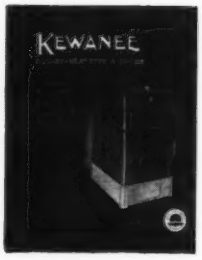
225—Continuous Blowoff

Publication 5700 deals with application of continuous blowoff systems to maintenance of boiler concentrations. Charts are included to permit rapid calculation of savings for any set of conditions. Various classes of systems are illustrated. Advantages of continuous blowdown over intermittent systems is discussed. *Cochrane Corp.*



226—Deaerating Systems

Eight-page bulletin 120A describes the need for deaerating feedwater in steam plants and explains the spray and boil-off types of deaerating feedwater heating systems available in economical standard units. Tables are given for determining size of system required and typical installations are shown in flow diagrams. *Whitlock Mfg. Co.*



227—Boilers and Burners

The Square-Heat Type R boiler for heating medium sized buildings dependably with high efficiency is described in four-page catalog 88. These units are available in 12 sizes—216,000 to 1,200,000 Btu steam, 243,000 to 1,350,000 Btu water—gas, oil, or stoker fired, and as gas-fired packaged units. *Kewanee Boiler Div., American-Standard.*



228—Packaged Boilers

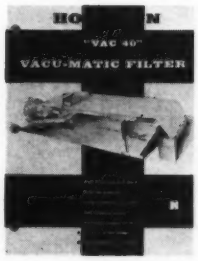
These two bulletins cover Series E and F Continental automatic boilers with ratings of 20 to 80 hp, with on-off control and modulating control. Units use No. 2, 5, and 6 oil or gas or can be furnished to burn either. Bulletins give specifications, dimensions, capacities, types, and illustrations of various sizes. *Boiler Engineering & Supply Co., Inc.*

PROCESS EQUIPMENT



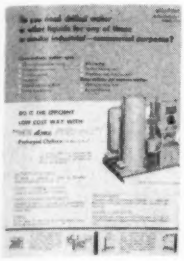
229—Hard Rubber Equipment

"Hard Rubber Equipment for the Chemical Process Industries," 20-page catalog, describes such products as pipe and fittings, pumps, containers, lined metal parts, and special molded parts. Dimensions of parts and lists of solutions safely handled are included along with engineering drawings and photographs. *The Luzerne Rubber Co.*



230—Vacuum Filters

Bulletin M-131 describes the Hoffman "Vac 40" filter, a completely re-designed, automatic, self cleaning unit for continuous filtration of grinder, hone, and other machine coolants. The filter medium, a special paper that is said to last five times longer than other paper filters, is discussed. *Filtration Div., U. S. Hoffman Machinery Corp.*



231—Packaged Chillers

The Acme FLOW-PAC packaged chillers in 1¾ to 5 hp ratings for industrial and commercial service are described in bulletin FP-102-1C. The bulletin, and collateral specification sheets furnished with it, describe both a new air cooled series of chillers with integral condensing units and a water cooled series. *Acme Industries, Inc.*



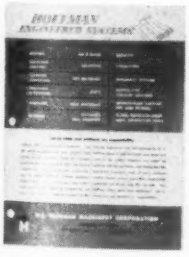
232—Compressed Air Drying

Four-page bulletin 223B covers the Lectrodryer equipment designed especially for handling compressed air, with particular reference to instrument air applications. It provides data on need for instrument air drying, moisture content of compressed air, and proper dewpoint and relative humidity. *Pittsburgh Lectrodryer Corp.*



233—Handbook of Crushing

"Handbook of Crushing," 40-page booklet, presents a wealth of data for any engineer faced with the problem of selecting the proper crusher for a certain job, or with analysis of a present installation. It gives details of selection, capacities, arrangements, types, and sizes. *Pennsylvania Crusher Div. of Bath Iron Works Corp.*



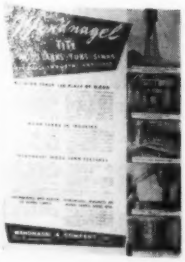
234—Pneumatic Equipment

Blowers, exhausters, pneumatic systems, Hoffco-Vac vacuum cleaners, Smooth-Flow tubular pipe and fittings, filters, flotation equipment, separators, and stills are described in four-page booklet M-133. It details their applications, operation, construction, and gives specifications. *Industrial Div., U. S. Hoffman Machinery Corp.*



235—Preheated Air for Processing

"The Ljungstrom Air Preheater for Process Equipment," 12-page bulletin, explains how use of this unit can reduce fuel costs, replace expensive still convection surfaces, and improve product quality in petroleum refineries. It also describes how the unit operates and specific advantages of the design. *Air Preheater Corp.*



236—Wood Tanks

Wendnagel Tite wood tanks, tubs, and sinks for all types of industries are described in four-page bulletin 23. Suggested uses will give you an idea of how these products fit in with your clients' needs. Examples shown include tanks for sprinkler systems, processing, general water supply, and metal pickling. *Wendnagel & Co., Inc.*



237—Oil Filters

Revised bulletin HF on the HILCO Hyflow Oil Filter, Standard Series, contains complete descriptions including sectional drawings in color showing internal working features. A tabulated listing of models makes correct selection easy and fast. Bulletin includes data on 21 cartridge filters and the FTC-1 Tuflite cartridge. *The Hilliard Corp.*



238—Tanks and Chests

Kalamazoo vitrified glazed tile tanks and chests are described in four-page bulletin 1 55-T. Drawings and photos show how the two types of tile blocks available provide flexibility of wall design. Types, sizes, design, erection, and cost are discussed, and typical installations in industry are pictured also. *Kalamazoo Tank and Silo Co.*



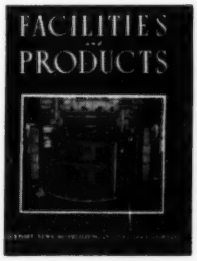
239—Silencers

Series ADS Acoustic Discharge Silencers, designed to eliminate both high and low frequency noises caused by high velocity steam and air discharged to the atmosphere, are described in four-page bulletin 265. Specifications are given for optimum silencing, standard silencing, and for heavy industrial areas. *Burgess-Manning Co.*



240—Mixers

"Simpson Mix-Mullers for the Ceramic Industry," four-page bulletin, outlines how this unit is used in the preparation of electronic porcelain, tile, structural clay and brick, refractories, whiteware, artware, dinnerware, and other ceramic bodies. Capacities, dimensions, and specifications on various models are listed. *National Engineering Co.*



241—Production Facilities

"Facilities & Products," 92 pages, is a presentation of a portion of the facilities acquired by Newport News during 68 years of continuous operation, together with some of their industrial products, such as paper and pulp machinery, castings and forgings, pipelines, turbines, and compressors. *Newport News Shipbuilding & Dry Dock Co.*



242—Filter Cartridge

Bulletin F-152 features the HILCO Filter Cartridge Type FHC for detergent or straight mineral oil filtration. Flow rate — pressure drop data is given in graphs for various sizes. Features important to insure your client peak filtration performance, such as heavy steel bail and Hiltex cellulose are described. *The Hilliard Corp.*



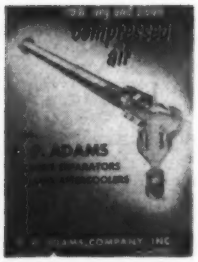
243—Purification of Oil

"The Purification of Oil by Centrifugal Force," 16-page bulletin, fully describes advantages of centrifugal purification of oil over other methods such as gravity settling. It details principles used in designing De Laval Centrifugals, and explains how these same principles can benefit your clients' operation. *De Laval Separator Co.*



244—Vapor Collectors

Vapor, mist, and fog control bulletin 622-3 illustrates the complete line of Aget Miskop Vapor Collectors and gives specifications on each model. Applications throughout industry are described in detail and illustrated. Ways in which Miskops can improve production and cut down product rejects are shown. *Aget Mfg. Co.*



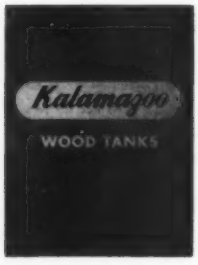
245—Aftercoolers-Separators

Bulletin 711 is a 12-page guide to limiting hidden costs of compressed air systems. It high-lights the benefits of dry compressed air; provides a check list to determine amount of removable moisture entering distribution line; and includes selection charts and cutaways of aftercoolers and cyclone separators. *R. P. Adams Co., Inc.*



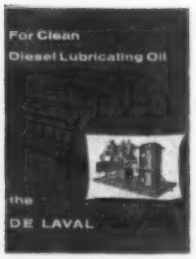
246—Heat Transfer Costs

"How to Cut Heat Transfer Costs," bulletin IP-356, features a detailed description of Tranter Platecoil construction, including specifications and dimensions. It lists and illustrates ten major advantages claimed for Platecoil and detailed sketches show 14 ways it has solved industrial heating problems. *Platecoil Div., Tranter Mfg., Inc.*



247—Wood Tanks

Eight-page bulletin 655-W explains why wood tanks can meet conditions other types of tanks cannot. It describes round, rectangular, and special tanks, vats, boxes, sinks, and flumes and lists possible uses for each along with the type of hardware and lining available, and gives installation photos. *Kalamazoo Tank and Silo Co.*



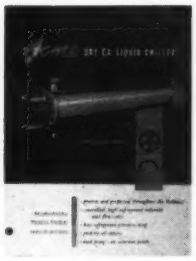
248—Cleaning Lube Oil

Explaining that really clean lubricating oil protects diesel engines from expensive damage and excessive parts wear, bulletin S.A946, four pages, describes how the De Laval Puri-Filter keeps diesel lube oil in like-new condition. It gives specifications, dimensions, and suggested installation arrangements. *De Laval Separator Co.*



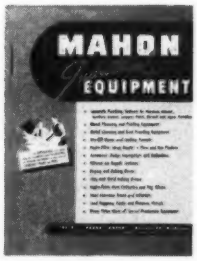
249—Vapor Condensers

Two-page bulletin 129R describes and diagrams functions and operation of Aero Vapor Condenser, new equipment to replace barometric type condensers that require large supplies of water and can not attain as high a vacuum. Uses illustrated include condensing steam, vapors, chemicals and intermediates, and reflux cooling. *Niagara Blower Co.*



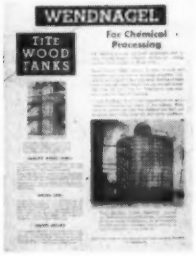
250—Liquid Chillers

Applications of Dry-Ex liquid chillers with star-insert tubing or plain tubing for air conditioning and refrigeration are listed in revised 16-page catalog 600-A. Construction details, engineering specifications, selection data, and procedure and selection curves are given, with principal dimensions and line drawings. *Acme Industries, Inc.*



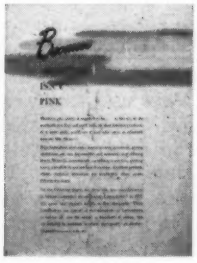
251—Industrial Equipment

The complete line of Mahon industrial equipment is described in 12-page catalog A-657, including finishing systems; metal pickling, cleaning, and rust proofing equipment; drying and baking ovens; spray booths; sludge segregators and unloaders; filtered air supply systems; dust collectors and fog filters; and special equipment. *The R. C. Mahon Co.*



252—Chemical Processing Tanks

Typical Wendnagel wood tanks manufactured for use in chemical processing are shown in this two-page bulletin. Resistance to decay, acids, and chemicals, and superior insulating properties are pointed out. Types for fire protection, water storage, wine storage, and scrubbing towers are illustrated. *Wendnagel & Co., Inc.*



253—Humidity Control

Bulletin 222 is a 32-page manual covering many examples of increased operating efficiency due to humidity control. Equipment illustrated includes air conditioning type Lectrodryers for maintaining lower humidities in rooms, high and low pressure air and gas dryers, breathers for storage tanks, and filters. *Pittsburgh Lectrodryer Corp.*



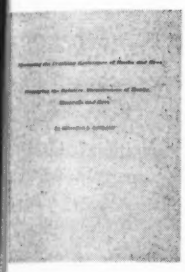
254—Low Headroom Deaerators

Ten-page bulletin W-210-B33 illustrates construction features and gives complete specifications on horizontal and vertical models of Low-Headroom Deaerators. Included are engineering drawings, dimension and fitting tables, and ratings for deaerators with capacities from 17,500 to 80,000 lb per hr. *Worthington Corp.*



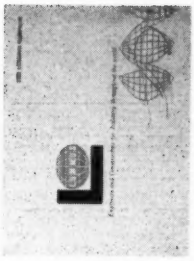
255—Air Preheater

How the Ljungstrom air preheater saves fuel, while improving performance of boilers, is told in 38-page bulletin. It gives structural details of the unit, points out ease of installation, how to modernize old installations, industrial uses, arrangements, specifications, and suggests typical additional uses. *Air Preheater Corp.*



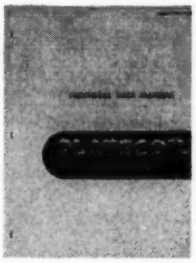
256—Crushing Resistance

"Measuring the Crushing Resistance of Rocks and Ores," 12-page booklet written by Benjamin B. Burbank, noted metallurgist, presents methods and equipment for measuring crushing resistance and abrasiveness of rocks, minerals, and ores. Detail sketches of testers are included. *Pennsylvania Crusher Div. of Bath Iron Works Corp.*



257—Process Equipment

This 20-page brochure is a brief sketch of the Lummus organization, detailing its experience in the process industries. Oil heaters used for major chemical and refinery processes, and heat transfer equipment, both standard and specially designed, and the divisions of the company that make the products are described. *The Lummus Co.*



258—Heat Transfer Manual

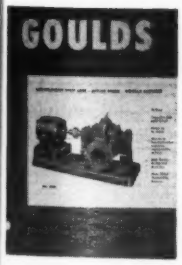
Technical Data Manual 514-C contains technical and engineering information concerning Tranter Platecoil heat transfer capacities and characteristics. Informative charts and tables based on research, experimentation, and field experience provide valuable short cuts in selection of heating and cooling systems. *Platecoil Div., Tranter Mfg., Inc.*

PUMPS & COMPRESSORS



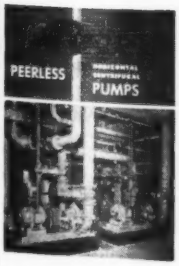
259—Industrial Pumps

"Verti-Line Close-Coupled Industrial Pumps," 12-page reference bulletin 1100, contains a valuable and easy to use table for determining horsepower, capacity, and head for vertical pumps, along with sectional views, material specifications, schematic application drawings, and photos of installations. *Layne & Bowler Pump Co.*



260—Double Suction Pumps

Goulds centrifugal pumps, horizontally split case, single stage, double suction types are described in 12-page bulletin 721-6. Specifications, mechanical data, sectional view, materials of construction, parts list, chart of parts interchangeability, performance graphs, dimensions tables, and pipe tap sizes are given. *Goulds Pumps, Inc.*



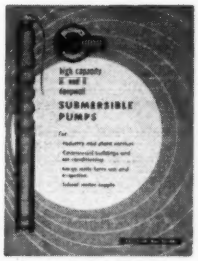
261—Centrifugal Pumps

Peerless Type A Horizontal Centrifugal Pumps for all purpose pumping are described in 16-page bulletin B-1300. General characteristics, construction features, dimension tables, parts lists, and sectional views are given for double suction (1½ through 48 in.) and bottom suction (12 through 42 in.). *Peerless Pump Division.*



262—Double Suction Pumps

Performance data, dimensions, and specifications on the De Laval single-stage double-suction Types L, M, and P centrifugal pumps, with capacities of 1000 to 20,000 gpm and heads to 350 ft, are presented in six-page bulletin 1004. Features, construction, dimensions, and advantages are described. *De Laval Steam Turbine Co.*



263—Submersible Pumps

Bulletin B-1000 describes Sumo's 6 and 8 in. deep well submersible water supply pumps, widely used for plants, schools, commercial buildings, and all types of services such as water supply, air conditioning, processing, and fire protection. Pump and motor are coupled together as a complete unit and operate under water. *Sumo Pumps, Inc.*



264—Air Compressors

This consolidated data sheet on air compressors lists all models, with specifications, in the ¼ to 20 hp range, single and two stage. Units are available as electric motor or gasoline engine driven. Air outfits for continuous operation also are described, and speed and displacement data are given for each. *Brunner Mfg. Co.*



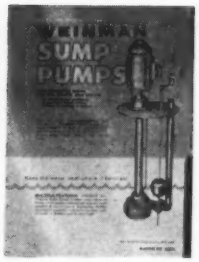
265—Centrifugal Pumps

Weinman single stage, single suction centrifugal pumps are detailed in four-page bulletin 400. Sectional views are shown for stuffing box and for mechanical shaft seal types. Principal dimensions for both pump and motor are given in drawings and tables. Construction advantages and features are discussed. *Weinman Pump Mfg. Co.*



266—Centrifugal Pumps

Twenty-page bulletin 5810-10 is a guide to selection of the proper Fairbanks-Morse single stage, split case centrifugal pump. Selection tables, typical specifications, principal dimensions of motor driven and belted pumps, and a table of friction of water in pipes are included along with a description of construction. *Fairbanks-Morse & Co.*



267—Non-Clogging Sump Pumps

Bulletin 500NC, four pages, gives pertinent information and details on Non-Clogging types of Sump Pumps, designed and built for superior performance in handling liquids of varying viscosity, containing foreign matter. Bulletin 500 SP is available on sump pumps for handling liquids with non-fibrous solids. *Weinman Pump Mfg. Co.*



268—Heavy Liquids Pumps

The steam jacketed liquid end, ball valve, piston type Wagener pump that permits pumping liquids such as asphalt, tar, oils, and heavy liquids is described in four-page bulletin 86. Specifications and dimensions are given for standard sizes, and low cost operation is explained. *Wagener Pump Div., Canton Stoker Corp.*



269—Rotary Gear Pumps

Eight-page bulletin G-2 gives construction, dimensions, capacities, and applications of Gearex Rotary Pumps: internal bearing type for lubricating materials; external bearing type for non-lubricating. Capacities are 1 to 550 gpm; pressures 250 psi for viscous liquids, 50 psi for water; viscosities 32 to 500,000 SSU. *Sier-Bath Gear & Pump Co., Inc.*



270—Centrifugal Compressors

Multi-stage centrifugal compressors, available for inlet volumes of 1000 to 150,000 cfm, are described in ten-page bulletin 0504. Typical installation photographs show the units in use in steel mills, oil refineries, for non-ferrous metal refining, chemical processing, sewage treatment, and food industries. *De Laval Steam Turbine Co.*



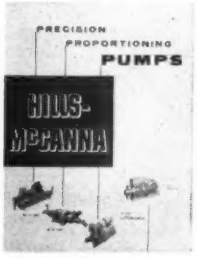
271—Rotary Pumps

Eight-page bulletin 57-SPS covers Viking general purpose rotary pumps; suitable for pressures up to 50 lb on non-lubricating liquids, 100 lb on lubricating liquids; available in capacities from 2/3 to 1050 gpm. It also covers heavy duty rotary pumps for pressures up to 200 psi, and designs for positive displacement pumping. *Viking Pump Co.*



272—Industrial Service Pumps

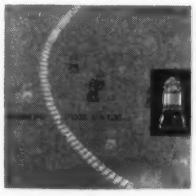
Vertical industrial service pumps for transfer and process service, for extra heavy duty, special duty, and heavy duty are detailed in 16-page bulletin B-505. Factors of good and bad sump design are diagrammed and a bibliography given. Photographs of these pumps in use for typical types of service are included. *Peerless Pump Division.*



273—Proportioning Pumps

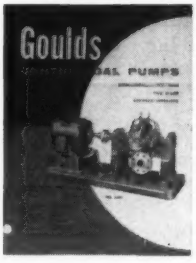
Eight-page bulletin 602, featuring Hills-McCanna metering and proportioning pumps, covers details and specifications of the Model U and K mechanical and hydraulic drive pumps, the Hills-McCannameter for precision pumping as low as 11 cc/min, and the new Model 4411 chemical pump for small capacity systems. *Hills-McCanna Co.*

To order personal copies of these bulletins, please fill out the card between pages 8 and 9 or 24 and 25.



274—Pumps

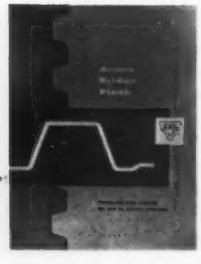
"Pumps For Sale," 16-page bulletin 900, containing a statement of policy, brief history of the company, description of organization and facilities, has been designed to show the relationship between the character of the company and the quality of its products. Verti-Line Pumps are illustrated in sectional views and photos. *Layne & Bowler Pump C.*



275—Opposed Impeller Pumps

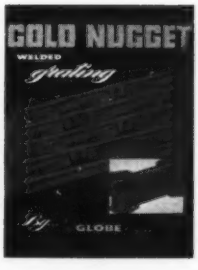
Goulds centrifugal pumps, horizontally split case, two stage, opposed impeller types, are described in 12-page bulletin 722-6. Specifications, mechanical data, sectional view, materials of construction, parts list, chart of parts interchangeability, performance graphs, dimensions tables, and pipe tap sizes are given. *Goulds Pumps, Inc.*

STRUCTURAL MATERIALS & EQUIPMENT



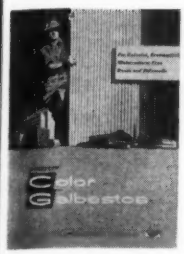
276—Metal Bridge Plank

Corrugated steel flooring for new or existing bridge structures is described in 14-page bulletin BP-8455, "Armco Bridge Plank." Engineering details and design data, recommended installation practice, and photo records are given. Design features 2-in. deep trapezoidal corrugations in 2-ft wide steel planks. *Armco Drainage & Metal Products, Inc.*



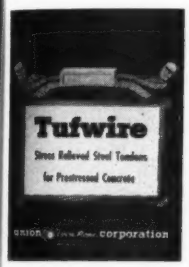
277—Welded Grating

This eight-page bulletin shows details of new lightweight, extra strong Gold Nugget Welded Grating suitable for power houses, loading docks, oil refineries, fire escapes, drain grates, and all types of heavy duty platforms. General engineering data, safe loading tables, and directions for specifying welded grating are given. *The Globe Co.*



278—Colored Roofing and Siding

Bulletin R-29, 12 pages, describes Robertson's newest product, Color Galbestos roofing and siding, available in six colors and three types of corrugation: standard corrugated sheet, mansard sheet, and V-beam sheet. Three types are described: without weatherproof coating; with one side coated; and both sides coated. *H. H. Robertson Co.*



279—Steel Tendons

"Tufwire Stress Relieved Steel Tendons for Prestressed Concrete," 12-page booklet, compares pretensioned and post-tensioned prestressed concrete and explains how Tufwire is to be used in each method. Stress graphs, tables of physical properties, and typical installation and construction photographs are included. *Union Wire Rope Corp.*



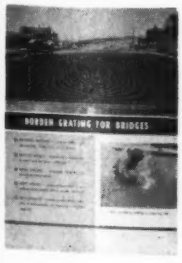
280—Steel Floor Plate

The hundreds of safety applications for A. W. Algrip abrasive rolled steel floor plate in various types of buildings are outlined in eight-page bulletin 3356. An allowable uniform load table and a table of maximum sizes for plate from ⅛ to ½ in. in thickness are given to assist in selection of the proper plate. *Alan Wood Steel Co.*



281—Electrified Floors

New 32-page office building manual describes underfloor electrical distribution system in fire-resistant precast concrete cellular floors. It gives design information on long-span Flexicore floor slabs and structural details for office building construction and underfloor electrical distribution layouts. *The Flexicore Co., Inc.*



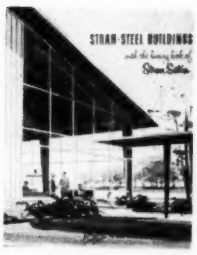
282—Bridge Grating

"Borden Grating for Bridges," eight-page booklet, describes standard and long span roadway grating, standard and lightweight sidewalk slabs, and standard package beam bridges. It gives design conditions, load tables, specifications, and detailed information to help in specifying these products. *Borden Metal Products Co.*



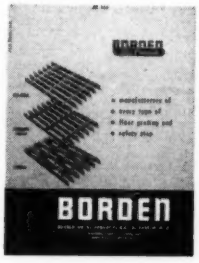
283—Concrete Construction

Versatility of Intrusion-Prepakt methods and materials used in overseas projects are demonstrated in this "International Prepakt Reporter." Twelve pages of illustrations show both unusual and standard applications of concrete construction and maintenance for dams, penstocks, underwater and underground installations. *Intrusion-Prepakt, Inc.*



284—Rigid Frame Buildings

Stran-Steel's new series of industrial and commercial rigid frame structures, 50 and 60 ft bow string buildings, and Stran-Satin metal wall are detailed in 18-page catalog 56-I-109. Illustrations show these buildings in use as manufacturing plants and warehouses, for retail operations, and municipal installations. *Stran-Steel Corp.*



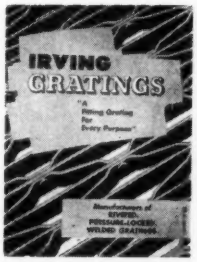
285—Floor Grating and Steps

Eight-page bulletin AT 155 gives complete directions for specifying all types of floor grating and safety steps—all-welded, pressure locked, and riveted. It describes all purpose floor grating of standard and ornamental design, safety grating, types for roadways, and for small building openings. *Borden Metal Products Co.*



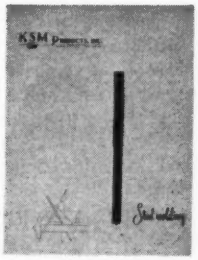
286—Curtain Wall Systems

"Bayley Curtain Wall Systems," 12 pages, describes and illustrates curtain wall designs to meet the present trend of skin-wall treatment for building construction, in which window units combined with decorative solid panels constitute the wall assembly. Band, tier, and flush-wall arrangements are detailed. *The William Bayley Co.*



287—Grating Products

This grating products catalog contains illustrations, descriptions, and engineering data on grating-flooring, treads, and industrial floor armoring for walkways, stairways, aisles, floors, bridge decking, and many other industrial and commercial uses. Riveted, pressure-locked, and welded type products are shown. *Irving Subway Grating Co., Inc.*



288—Stud Welding

"Stud Welding" is a collection of bulletins covering the various types of construction for which this method of fastening may be used. It includes data on fasteners, equipment, and application methods for fastening aluminum, steel, and asbestos corrugated roofing and siding, and flat asbestos and insulation board. *KSM Products, Inc.*



289—Rolling Doors

Twelve-page bulletin 92 demonstrates how both wood and steel RoL-TOP doors, with their straight-line outward appearance, are well suited to modern building needs. Drawings show recommended types for various applications and clearances, types of operation, special features, and dimensions. *Kinnear Mfg. Co.*



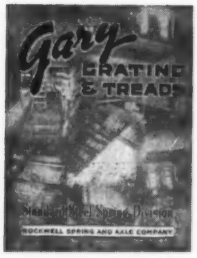
290—Welding Studs

Standard designs and specifications of KSM welding studs are covered in 36-page bulletin G-102. It includes a dimensional drawing of each type of fastener, materials in which each is available, plating, annealing, flux, and arc shield data. Brief descriptions of other welding products also are given. *KSM Products, Inc.*



291—Bridge Decking

"Decking for Bridges" catalog contains drawings, photos, descriptions, and engineering data on open metal grid bridge roadways. It points out advantages such as light weight, cleanliness, drainage, safety, durability, strength, and traction, as well as the economies effected through minimum maintenance. *Irving Subway Grating Co., Inc.*



292—Grating and Treads

Gary grating and treads tailor-made to suit your individual requirements are illustrated in a 24-page brochure. Two-page spread includes tables of safe loads, specifications, and other engineering data. Photographs also show many typical applications of the decking. *Standard Steel Spring Div. of Rockwell Spring and Axle Co.*



293—Storage Walls

This eight-page bulletin introduces Hallowell storage wall — a versatile shelf and drawer system for stocking small parts, file cards, records, and similar items. Illustrations show how nests of steel drawers are stacked and bolted together to form self-supporting walls or partitions for office or shop use. *Standard Pressed Steel Co.*



294—Steel Windows and Doors

In 36-page bulletin BSW-57, Bayley Steel Windows and Doors (also operating units and accessories) are shown in layouts and sizes to modular standards recommended by the Metal Window Institute. Included are drawings and specifications for the new intermediate steel window wall, Series S-150. *The William Bayley Co.*



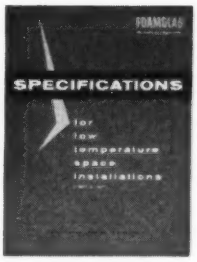
295—Precast Floors and Roofs

The Flexicore fire-resistant precast concrete floor and roof system is described in this eight-page bulletin. It includes details on use with structural steel, reinforced concrete, and wall-bearing construction. It gives electrical and mechanical details, load tables, design information, and complete specifications. *The Flexicore Co., Inc.*



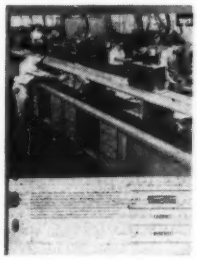
296—Design Suggestions

"Ideas for Gold Bond Corrugated Asbestone 'Standard 400'," 16-page form 2381, presents design suggestions to stimulate your imagination. It covers use of the product as roofing and siding for plant exteriors, churches, and schools, and its use in interiors, for fences and walkways. Each application is illustrated. *National Gypsum Co.*



297—Refrigeration Insulation

"Specifications for Low Temperature Space Installations," 20 pages, contains latest recommended methods for installing FOAMGLAS cellular glass insulation on walls, floors, ceilings, and roofs of refrigerated spaces operating between -50 and 50 F. It lists suggested thicknesses, adhesives, finishes, and paints. *Pittsburgh Corning Corp.*



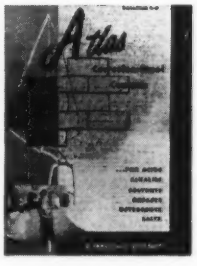
298—Cabinet Benches

Form 2104 is a 12-page review of Hallowell all steel cabinet benches for toolroom, test laboratory, and instrument shop. Units are available with steel, Presswood-covered steel, laminated wood, or ShopTop bench tops. Multiple unit construction and interchangeable accessories facilitate layout. *Standard Pressed Steel Co.*



299—Floor Panels and Roof Deck

This catalog of engineering information on the Fenestra line of panels and deck for floors, ceilings, and roofs covers Fenestra Electrifloor (cellular panel plus header duct system), panels for recessed lighting, acoustical panels, complete insulated roofs, and data for designing for seismic shear and wind loads. *Fenestra, Inc.*



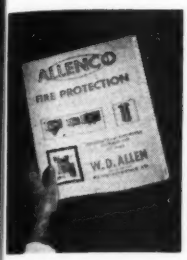
300—Corrosion-Proof Cements

Twelve-page bulletin 5-2 describes corrosion-proof cements made by Atlas. It gives chemical characteristics, data for estimating amount necessary, and lists typical industries using these cements for protection against acids, alkalies, solvents, greases, detergents, salts, and other industrial corrosive materials. *Atlas Mineral Products Co.*



301—Concrete Wall Panels

Insulated precast concrete wall panels and rigid steel framing combined in custom "Panel Bilt" buildings are shown in four-page pamphlet 7285. Panel and structural details are shown for each industrial and commercial purpose described. How this type of construction saves time and money is explained. *The Marietta Concrete Corp.*



302—Interior Fire Protection

Current Allenco catalog 150, 42 pages, presents the diverse line of interior fire protection equipment available from W. D. Allen. Basic specifications, photos, drawings, full details, and application suggestions are given for hose, extinguishers, cabinets, connections, and allied types of fire protection equipment. *W. D. Allen Manufacturing Co.*



303—Flexible Pavements

"Thickness Design—Flexible Pavements for Streets and Highways," 44-page booklet, outlines alternate designs for each of a variety of traffic and loading conditions. Included are sections on traffic analysis, materials analysis, alternate designs, and economic considerations. Price, 20¢. You will be billed. *The Asphalt Institute.*



304—Heavy Equipment Grouting

Techniques for non-shrink grouting of heavy equipment and machinery are clearly shown in eight-page grouting guide EPMG-2. Discussion and illustrations cover shrinkage, impact, vibration, alignment, and advantages of use of Pre-Mixed Grout. Other uses where grout is held under constraint are described. *The Master Builders Co.*



305—Density Tester

Bulletin CN-980 contains complete information on the new Volumeasure, a self-contained, lightweight, and accurate unit designed for fast and simple field or laboratory in-place density tests of soils. The unit provides a positive test method for use in embankment control and subgrade compaction projects. *Soiltest, Inc.*



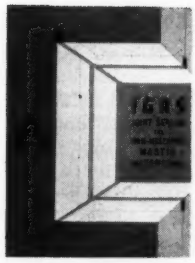
306—Bridge Flooring

This 32-page booklet contains complete descriptions, specifications, drawings, and design data covering all types of AmBridge I-Beam-Lok. Also included are details of flooring applications plus a brief discussion showing how Composite Tee-Beam Action can be used with I-Beam-Lok. *United States Steel Corp., American Bridge Div.*



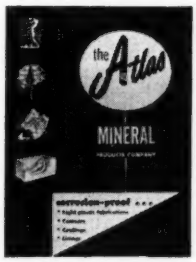
307—Industrial Doors

Bulletin 93, 24 pages, is a complete catalog of the many types of doors made by Kinnear. It gives information on the types of operation, both manual and electrical; elevation drawings; mounting methods for various applications and locations; specifications; and explains special construction features. *Kinnear Mfg. Co.*



308—Joint Sealer

Four-page bulletin IS-56, "Igas Joint Sealer, the Non-Meltable Mastic Waterstop," describes the properties of Igas, its use in water reservoirs, swimming pools, tunnels, and deep basements, and its suitability for all structural materials. Specifications and architectural details will be sent also. *Sika Chemical Corp.*



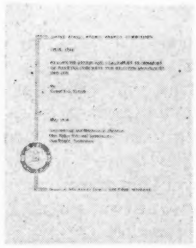
309—Corrosion-Proof Products

Sixteen-page bulletin CC-3 gives complete information on all of the services and products of this company, such as corrosion-proof cements, linings, coatings, rigid plastic fabrications, rigid plastic pipe and fittings, and pipe joint compounds. Also described are permanent corrosion resistant industrial floors. *Atlas Mineral Products Co.*



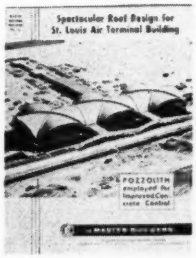
310—Bearing Pile Tests

"H-Beam Bearing Pile Tests in Chicago," 12-page bulletin, gives the results of the tests conducted by Armour Research Foundation for U. S. Steel to determine the over-all performance of steel H-beam bearing piles in soil strata found in the Chicago loop area. Data are tabulated, charted, and discussed in detail. *United States Steel Corp.*



311—Concrete for Reactors

This illustrated technical article, published by the Atomic Energy Commission, tells how high density Prepakt concrete was used as a biological shield at the Materials Testing Reactor, Arco, Idaho. It includes a chart showing pressure grout concrete properties using heavy aggregates, and diagrams of structures. *Intrusion-Prepakt, Inc.*



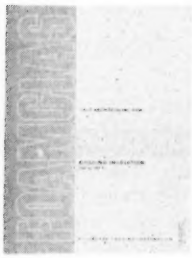
312—Thin Shell Concrete

The complete story of the design and construction problems encountered during erection of the St. Louis Airport Terminal Building is told in eight-page bulletin MBR-P-10. Use of Pozzolith to produce high flexural strength concrete with minimum shrinkage and a controlled rate of hardening is described. *The Master Builders Co.*



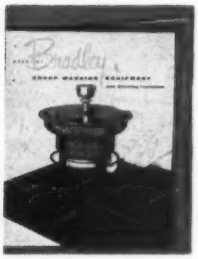
313—Metal Curtain Wall

Metal curtain wall panels and 10 and 12 in. joists are among the new products described in 24-page catalog. Engineering data and detail drawings are given for complete structural systems utilizing Stran-Steel products, along with load tables, design examples, suggested specifications, and descriptions of each product. *Stran-Steel Corp.*



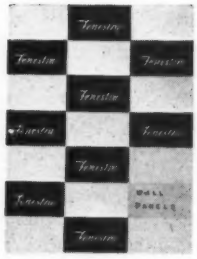
314—Building Insulation

The 1957 edition of the 24-page booklet "FOAMGLAS Building Insulation" is intended as both catalog and reference manual. It contains complete data on the latest recommended procedures for application of FOAMGLAS cellular insulation on flat roofs, pitched roofs, parking decks, curtain walls, and perimeters. *Pittsburgh Corning Corp.*



315—Washroom Equipment

Catalog 5601 includes complete information on Bradley Washfountains from the 54-in. full-circle model that accommodates up to 8 or 10 washers to the 2-person Duo-Washfountain with foot control of water supply and sprayhead in place of faucets. Data on group showers and drinking fountains are included. *Bradley Washfountain Co.*



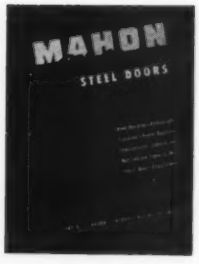
316—Metal Wall Panels

This catalog for engineers and architects presents Fenestra insulated panels and siding for curtain wall construction. Complete with installation details, span tables, engineering data, and specifications, it gives reasons for using lightweight panel walls. It covers also acoustical wall panels and movable fire partitions. *Fenestra, Inc.*



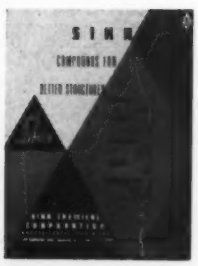
317—Compression Tester

Bulletin AP-350 illustrates and describes the Versa-Tester, a multi-purpose compression testing machine ideal for research or routine laboratory testing. Accurate tests requiring capacities to 30,000 lb can be performed simply and quickly on soils, bituminous materials, mortar, concrete, plastics, metals, and wood. *Soiltest, Inc.*



318—Steel Doors

Hand operated, mechanically operated, and power operated Underwriters' labeled and non-labeled rolling steel doors, grilles, and shutters to meet every door requirement are described and illustrated in 16-page catalog G-57. Complete specifications are given for each type along with drawings and dimensions. *The R. C. Mahon Co.*



319—Concrete Treatment

Four-page bulletin, "Sika Compounds for Better Structures," deals with five phases of concrete and masonry construction: concrete, mortar, protection, sealing, and maintenance. In each category there are several products listed as suitable, each with a description and short specification. Typical applications are pictured. *Sika Chemical Corp.*



320—Hot-Mix Asphalt Paving

"Mix Design Methods for Hot-Mix Asphalt Paving," 168-page book, outlines in detail four methods: Marshall, Hveem, Hubbard-Field, and Smith Triaxial. It includes general information, preparation of test specimens, test procedures, and interpretation of test data for each. Price, $1.00. You will be billed. *The Asphalt Institute.*



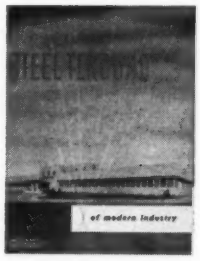
321—Roofing and Siding

A complete story in one brochure, "Gold Bond Corrugated Asbestone Roofing and Siding," tells you, the consulting engineer, about one of National Gypsum's most versatile products — Corrugated Asbestone "Standard 400." Bulletin highlights exhaustive testing and manufacturing process and shows applications. *National Gypsum Co.*



322—Fillers and Sealers

Specifications and recommended uses for premolded and hot-poured joint fillers and sealers for concrete construction work, asphalt planks for flooring and bridge decking, closure strips for corrugated construction, rubber water stops, and similar products are presented in new 16-page catalog 10M-1056. *Servicised Products Corp.*



323—Steel Tendon Facilities

"Steel Tendons of Modern Industry," 28-page bulletin, presents a pictorial tour of the modern Union Wire Rope factory, including the laboratory, heat treatment and cleaning departments, die room, wire drawing, galvanizing, spooling and welding, and stranding departments. Bulletins are listed for each product. *Union Wire Rope Corp.*

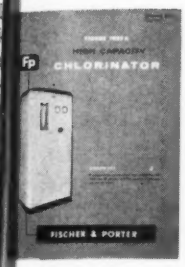


324—Sub-Floor and Roof Deck

This 44-page technical manual is a complete compilation of data on cellular steel sub-floor (Q-Floor) and roof deck (Q-Deck). It contains complete specifications and structural details plus such valuable sections as property tables, dimensions, load tables, and a floor plan of a typical office layout using Q-Floor. *H. H. Robertson Co.*

To order personal copies of these bulletins, please fill out the card between pages 8 and 9 or 24 and 25.

WATER TREATMENT AND WASTE DISPOSAL



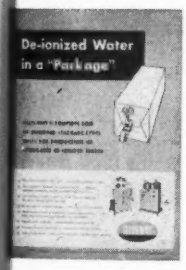
325—Chlorinators

Twenty-page catalog 70-15 describes Fischer & Porter's High Capacity Chlorinators, units that are constructed of completely corrosion resistant materials, with capacities of from 60 to 8000 lb per day of chlorine. Flow diagrams, typical installation plans, and dimensions and specifications are included. *Fischer & Porter Co.*



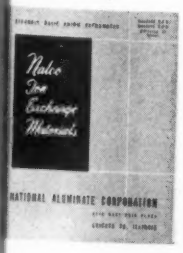
326—Waste Treatment

Bulletin WC-116 shows some of the industrial waste treatment processes that Graver can furnish to handle a wide variety of waste problems. Four case histories are presented describing processes for metal plating, petroleum, pulp and paper, and for making water reusable where water is very scarce. *Graver Water Conditioning Co.*



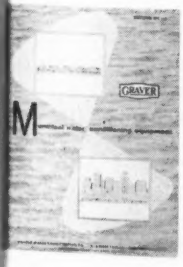
327—Packaged De-ionizers

"De-ionized Water in a Package," four-page folder PK-256, describes a complete line of standard (package-type) units for production of solids-free de-ionized water. Labeled pictures show units that produce low-solids water and units that produce chemically pure water. Portable de-ionizers are described. *Illinois Water Treatment Co.*



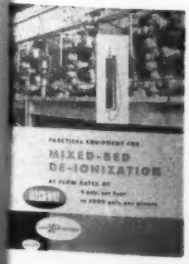
328—Anion Exchangers

Bulletin 57, 40 pages, gives physical data on Nalcite SAR and SBR strongly basic anion exchangers and complete information on their use in demineralizing water. It explains operating and regenerating techniques, expected capacities under various operating conditions, and data on a new porous grade Nalcite SBR. *National Aluminate Corp.*



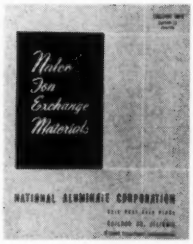
329—Municipal Water Conditioning

"Municipal Water Conditioning Equipment," 12-page bulletin WC-113, describes Graver's complete line. It gives design and operational drawings of the Graver Reactivator, including its use as a package water treatment plant: iron removal units; zeolite softeners; swimming pool units; and feedwater units. *Graver Water Conditioning Co.*



330—De-ionization

Equipment for mixed-bed de-ionization at flow rates of 5 gph to 5000 gpm is described in eight-page bulletin. Diagrams illustrate each phase of operation — service, backwash, simultaneous regeneration, and mixing. Packaged units shipped completely assembled with piping and controls are described briefly. *Illinois Water Treatment Co.*



331—Cation Exchangers

Bulletin 58, 24 pages, gives physical data on Nalcite HCR cation exchanger and complete information on its use for commercial, municipal, and industrial water softening. It covers capacity ratings, hardness leakage, regeneration and operation for both cold and hot water service, and sodium and hydrogen cycles. *National Aluminate Corp.*



332—Sewage and Trash Pumps

The new Fairbanks-Morse bladeless sewage and trash pump, with the recently developed single passage bladeless impeller, is described in 16-page bulletin 5400K-1. Details of construction and drive modifications are given for horizontal and vertical shaft pumps, along with dimensions and specifications tables. *Fairbanks-Morse & Co.*



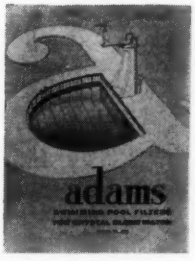
333—Water Supply

"Supplying Water for Municipal and Industrial Use," 20-page catalog, explains how the Ranney Method can provide any type of water program for these users. Horizontal collectors, infiltration galleries, vertubes, and intakes are fully described. Photographs and schematics depict each operation. *Ranney Method Water Supplies, Inc.*



334—Filmeen Treatment

Control of corrosion in return lines through the use of Filmeen treatment is described in eight-page bulletin 5013-B. It explains how this product prevents corrosion caused by CO_2 or oxygen by forming a protective, monomolecular film on metal surfaces. Methods of application and testing are outlined. *Dearborn Chemical Co.*



335—Swimming Pool Filters

Bulletin 625, 24 pages, discusses filtration for modern swimming pools of 50,000 gal capacity and over. It has sections on design features of purification and filtering systems, operation phases of filtration cycle, choosing the right filter, installation drawings, dimension charts, and table of filter sizes. *R. P. Adams Co., Inc.*



336—Water and Steam Cycles

"Industrial Water Treatment and Engineering Service" tells of the five basic lines of defense to guard against difficulties in water and steam cycles. A two-page diagram shows a water and steam cycle power plant layout and indicates the usual tests required on samples taken at designated points. *Dearborn Chemical Co.*

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This supplement provides a current and detailed description of bulletins, catalogs, and other literature offered by advertisers in CONSULTING ENGINEER. Products and services offered are grouped into the general categories shown below. A full index is provided on the back cover. Keep this supplement in the front of your catalog file and refer to it when you need product data. Four postcards are provided for ordering copies of bulletins you need.

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Bring your Technical Reference Files up to Date

Part 2 May 1957

AIR CLEANING AND DUST COLLECTION



1—Electronic Air Cleaners

"A Close Look at Air-Borne Dirt," 24-page booklet of drawings, shows what science has learned about air pollutants and illustrates the growing cost of air-borne dirt to industry. It explains how electronic air cleaners reduce expenses, their method of operation, and their construction. *Minneapolis-Honeywell Regulator Co.*



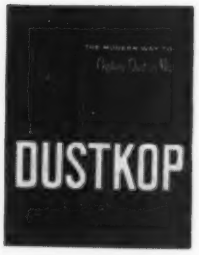
2—Electric Precipitators

The five basic engineering factors governing the success of precipitator installations are fully described and illustrated in a 22-page booklet, "Buell SF Electric Precipitators." Factors include positive gas flow control, uniform electrode emission, rapping method, mechanical construction, and high voltage supply. *Buell Engineering Co.*



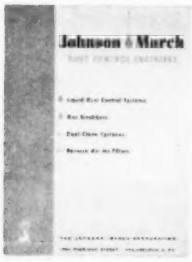
3—Dust Control Equipment

Illustrated, 40-page catalog 800, "Industrial Dust Recovery and Control," describes the complete line of Dracco equipment for preventing spread or waste of dust. It includes engineering data, dimensions, and specifications for all system components, and gives details and user advantages for existing systems. *Dracco Corp.*



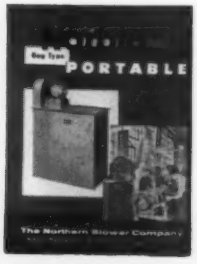
4—Dust and Mist Separation

"The Modern Way to Capture Dust or Mist" describes the cyclone principle of separating dust and mist from air. It contains illustrations of typical Dustkop installations and information on types of equipment available for shipment from stock. Dimensions, specifications, and suggested uses are given for each type. *Aget Mfg. Co.*



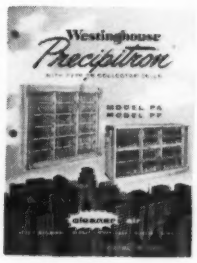
5—Dust Control Equipment

General catalog GC 3755 has been prepared specifically for consulting engineers. It points out the broad range of dust control equipment and engineering services offered by this company. It covers Liquid Dust Control Systems, Gas Scrubbers, Dual-Clone Cyclones, Reverse Air Jet Filters, and other units. *Johnson-March Corp.*



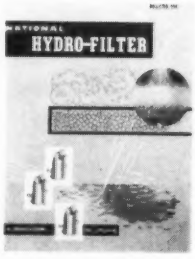
6—Portable Dust Collectors

Small and medium size dust collectors, applicable to single machines or small groups of equipment producing undesirable dust, are described in four-page bulletin 162-6. Capacities range from 300 to 1350 cfm; 5000 fpm velocity in pipes, and 8 in. static pressure at the fan. These include portable and semi-portable sizes. *The Northern Blower Co.*



7—Electronic Air Cleaning

Catalog 1460, on the new Hi-Velocity Precipitron for commercial electronic air cleaning, outlines such features as 65 percent reduction in space requirements, 50 percent increase in capacity, and removal of 90 percent of all dirt, dust, smoke, and pollen, with no filters to store or maintain. *Westinghouse Electric Corp., Sturdevant Div.*



8—Dust Collectors

Outstanding features of the National Hydro-Filter Dust Collector are described in four-page bulletin 556. Ease of operation and maintenance, versatility, cost factors, separating efficiency, controls, and construction and design are discussed. Dimensional data, specifications, and drawings also are provided. *National Dust Collector Corp.*



9—Dust Recovery

"The Collection and Recovery of Industrial Dusts" is a 28-page booklet detailing and illustrating all three Buell systems of industrial dust recovery: cyclone, electric precipitator, and low resistance fly ash collector. Indexed bulletin fully covers operating principles, sizing methods, and design details of each. *Buell Engineering Co.*



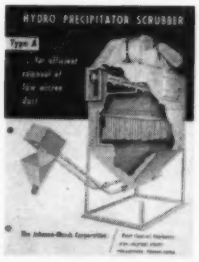
10—Stationary Vacuum Cleaners

Booklet AA-100 describes successful stationary vacuum cleaning for the removal of all kinds of dust, with a detailed description of the systems and their accessories. It details savings and advantages of the systems and outlines ways of solving plant problems of sanitation, quality control, and cost. *U. S. Hoffman Machinery Corp.*



11—Centrifugal Dust Collectors

Improved design of the Norblo High Efficiency Low Static (H.E.L.S.) centrifugal dust collector includes deeper body and improved proportions and does away with dampers frequently used to overcome back pressure, according to four-page bulletin 104-3. Capacities and principal dimensions are listed. *The Northern Blower Co.*



12—Wet Scrubbers

Twelve-page catalog HP 955 describes the new Type A Hydro-Precipitator — a wet scrubber that effectively collects dust under five microns in particle size. In pilot plant tests, the units have attained efficiencies up to 95 percent on dusts, 78 percent of which were under two microns in size. Bulletin lists applications. *Johnson-March Corp.*

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13—Control Centers

A new concept in automatic temperature control is illustrated and described in eight-page bulletin F 8031, "Electronic Control Centers." It discusses in detail functions, uses, and advantages of centralized automatic control with convenient visual supervision of the entire air conditioning and heating system. *Barber-Colman Co.*



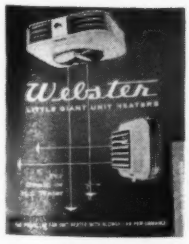
14—Air Conditioning Equipment

Twelve-page bulletin 805 describes the Dunham-Bush 'MZ' Multizone air conditioning units that provide simultaneous air conditioning of separate zones or rooms with a single unit at desired temperatures. Design, construction, and operation are covered as well as method of selection, dimensions, and capacities. *Dunham-Bush, Inc.*



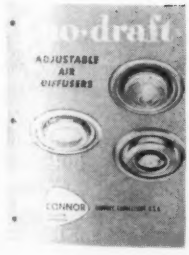
15—Heating and Ventilating

Publication 500-1, 36 pages, fully describes Nesbitt Series "G" general purpose heating and ventilating unit for auditoriums, gymnasiums, showrooms, offices, laboratories, schools, stores, and similar spaces. It is available in 12 basic sizes with air deliveries from 1000 to 15,700 cfm, providing 36,600 to 1,390,000 Btu. *John J. Nesbitt, Inc.*



16—Unit Heaters

Bulletin B-1730, 20 pages, gives details, capacities, and application and selection data on the 34 model line of newly improved Webster Little Giant unit heaters, which are useable interchangeably with steam or hot water. Capacities range from 34,000 to 684,000 Btu per hr, with a wide choice of air deflectors. *Warren Webster & Co.*



17—Diffusers

Bulletin K-20-A, 32 pages, contains valuable information designed to aid in the selection of diffusers. It describes Kno-Draft adjustable air diffusers, gives selection data, performance ratings, typical installation photographs, noise level graphs, specifications, and other valuable engineering data for the consultant. *Connor Engineering Corp.*



18—Refrigeration Equipment

New catalog R-400, 12 pages, on refrigeration and air conditioning units, includes Kramer's redesigned Wedge for reach-in refrigerators, Unicorn air cooled condensers, Kramer All-Season Winterstat, Coolmaster, and the "L" Thermobank automatic hot gas defrosting system. Selection tables are given. *Kramer Trenton Co.*



19—Steam Coils

"Marlo Steam Coils," 24-page bulletin 10, includes photos and construction features of all Marlo coils: dimensional data; method of selecting the proper coil for any installation; capacity rating charts; capacity data; and installation methods. Information is in table form for quick and easy reference. *Marlo Coil Co.*



20—Air Blender System

Four-page folder SA-3011 on the new Honeywell air blender system gives important information on high velocity air distribution systems. Advantages include: constant, self-balanced volume of delivered air with temperature maintained according to demands and self-powered by air in system. *Minneapolis-Honeywell Regulator Co.*



21—Industrial Fans

Catalog 1110 covers the new Westinghouse Axilflo fans for tough air, fume, and vapor handling jobs in industry. Advantages such as low first cost, small space requirements, and extended capacity range are detailed. Sizes are 15 to 72 in. wheel diameter, volumes 1700 to 100,000 cfm. *Westinghouse Electric Corp., Sturdevant Div.*



22—Semi-Pressure Fans

New Aerovent SP-7 semi-pressure fans, for efficient performance against static pressures normally considered above the range of propeller type fans, are described and illustrated in bulletin 400. Available in direct connected, direct driven duct, belt driven duct, Bi-Flo duct, and extended shaft types, 14 to 16 in. dia. *Aerovent Fan Co., Inc.*



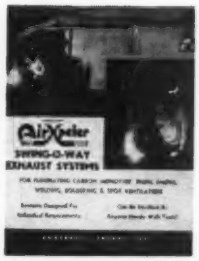
23—Steam Heating System

"Tune in with the Weather," 16-page bulletin 540, describes Selectotherm, an automatically controlled vacuum steam heating system with a single dial control to balance heat supply against heat loss. A drawing of a typical arrangement is provided, along with specifications, a selector guide, and performance data. *Illinois Engineering Co.*



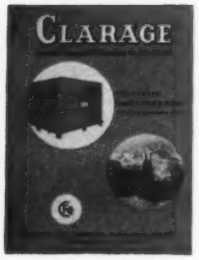
24—Air Diffusers

Selection Manual No. 60, 80 pages, on air diffusers for air conditioning, heating, and ventilating systems, contains numerous diagrams, tables, and photographs to aid in the selection of the correct units for All-Air high velocity systems, conventional systems, and high temperature differential systems. *Anemostat Corp. of America.*



25—Movable Duct Exhauster

The AirXpeler Swing-O-Way Exhaust System for eliminating carbon monoxide, diesel smoke, and welding and soldering fumes, and for spot ventilation is described in two-page bulletin 675R. Units are designed for use where traveling overhead cranes do not permit duct work from the ceiling. *Ammerman Company, Inc.*



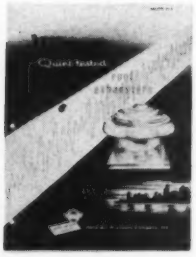
26—Air Conditioning Units

Four-page bulletin 1312 covers the Hi-Static Multitherm unit, developed principally for high velocity, conduit type air conditioning systems. Available in seven sizes, covering a volume range of about 2500 through 22,000 cfm, and suitable for systems having a static pressure of 8-in. wg maximum. Specifications are given. *Clarage Fan Co.*



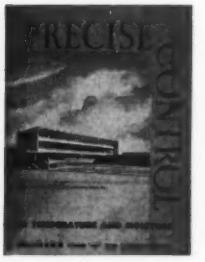
27—Cleanable Cooling Coils

Bulletin R-50 describes and illustrates Aerofin Type R Removable-Header Water Coils. These are cleanable-tube extended-surface coils for cooling air with water. Principal advantages are easy cleaning of tubes and positive drainage. Engineering data for various pass arrangements are given to assist in selection. *Aerofin Corp.*



28—Direct Drive Exhausters

Direct drive roof exhausters with capacities from 150 to 4200 cfm are described in four-page bulletin 56-A. Included are noise level recommendations, methods of installation, and an explanation of the U-spring type of vibration isolator featured on Jenn-Air equipment. Performance data is given. *Jenn-Air Products Company, Inc.*



29—Air Conditioning

Precision control of air temperature and moisture enable your client to produce his product in any climate, at any season, according to six-page bulletin 122. The Type "A" air conditioner described, for drying or moistening of air, is shown in typical installation photographs. Drawing points out operation. *Niagara Blower Co.*



30—High Temperature Water Heating

Basic advantages of the Type LFW Forced Recirculation Generators for high temperature water are given in ten-page bulletin 700. Chart compares capital investment, operating costs, and maintenance and repairs for high temperature water and high pressure steam for district heating from central heating plant. *International Boiler Works Co.*



31—Hot Water Boiler

HCC-2, 20-page brochure, describes and illustrates the design, construction, advantages, and economies of the C-E La Mont controlled circulation hot water boiler for supplying high pressure, high temperature water for heating systems and process applications. Layouts and elevation drawings are given. *Combustion Engineering, Inc.*



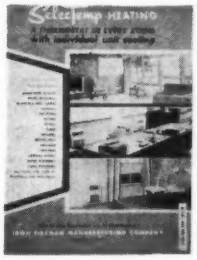
32—Refrigeration

Condensed catalog 493, eight pages, gives complete specification data on refrigeration units—air cooled, combination air and water cooled, and water cooled—in the ¼ through 100 hp range. Single and two stage compressors, compressor units, and condensing units are shown with suggested uses. *Brunner Mfg. Co.*



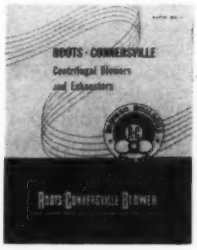
33—Gravity Roof Exhausters

Twelve-page bulletin 100 gives capacities, dimensions, curb details, and construction design of the new AirXpeler Power Gravity Roof Exhausters, units of low silhouette, available as direct or belt driven. Low cost operation for low and high static pressures, and natural draft fresh air supply features are described. *Ammerman Company, Inc.*



34—Modulating Zone Heating

Application of the SelecTemp heating system to commercial buildings of all types and sizes is described and illustrated in eight-page folder 5627. This system, featuring a non-electric thermostat on each unit, provides temperature control in each individual room or area. Construction is shown. *Iron Fireman Manufacturing Co.*



35—Centrifugal Blowers

Bulletin 120-B-14 contains illustrations, performance characteristics, and specifications for a complete line of single stage and multistage centrifugal blowers and exhausters. Single stage units have capacities 500 to 60,000 cfm, 1 to 8 psig; and multistage units have capacities 1000 to 100,000 cfm, 8 to 600 psig. *Roots-Connersville Blower Div.*



36—Smooth-Fin Heat Exchangers

Bulletin S-55 describes new smooth-fin heat-transfer coil construction that permits closer fin spacing, greater capacity per sq ft of face area, and use of higher air velocities without turbulence or excessive friction. It also illustrates many types of extended-surface heat exchangers for heating, cooling, and processing. *Aerofin Corp.*



37—Bell-Ex Roof Ventilators

A centrifugal roof ventilator aerodynamically designed to exhaust against high resistance and offering flexibility, space-saving, and economy is illustrated and described in four-page bulletin 565. Capacities and dimensions are included, together with descriptions of propeller-type roof ventilators for lower resistances. *The New York Blower Co.*



38—Fire Vents

A quick-opening fire vent to permit rapid escape of smoke, heat, and gases in event of fire is described and fully illustrated in form 701. Known as the Pyrojector, the unit installs entirely above the roof line and is opened instantly when heat melts a 212 F fusible link. Suggested specifications are given. *The Swartwout Co.*



39—Ventilation Noise Control

"Controlling Ventilation Noises" is a comprehensive brochure on ventilation noise control research performed at Armour Research Foundation. It gives engineering information in tables to enable you to predict accurately the noise level a DeBothezat fan will produce. *DeBothezat Fans Div., American Machine and Metals, Inc.*



40—Exhaust Fans

Eighteen-page bulletin SDA-160 gives features, capacities, performance data, and dimensions for commercial and industrial exhaust fans; vertical or horizontal Ventilattic fans; penthouses; automatic wall and ceiling type louvers; belt drive utility blowers; direct drive blowers; and radial blade blowers. *Peerless Electric Co.*



41—Air Distribution Grilles

The complete line of Uni-Flo air distribution grilles, return registers, and accessories is covered in 24-page catalog 1415-12. In addition to specifications, descriptive information, and photographs of the grilles, the booklet contains data and illustrations of smoke tests demonstrating the performance of the units. *Barber-Colman Co.*



42—Radiant Heating

"Radiant Panel Heating with Steel Pipe," 48 pages, covers the history of this type of heating, basic design, floor, ceiling, and wall panels, information on snow melting systems, pipe coil integration, design of a floor coil system, and a boiler hook-up diagram. *Committee on Steel Pipe Research, American Iron and Steel Institute.*



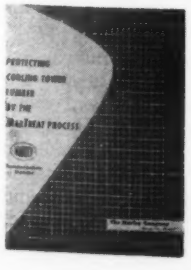
43—Air Filters

"The Amazing Story of the Absolute Filter," eight-page bulletin 106A, tells about the development of the filter for the Atomic Energy Commission and its subsequent "declassification" for use in industry where critical air cleaning problems exist. Construction, dimensions, applications, and ratings are given. *Cambridge Filter Corp.*



44—Water Cooling Equipment

How Thrifti-Tower water cooling equipment solves water problems and minimizes costs on commercial, industrial, and residential air conditioning and refrigeration installations is explained in four-page folder ACC 175. Dimensions and ratings, noise level ratings, and construction are shown. *Airtemp Div., Chrysler Corp.*



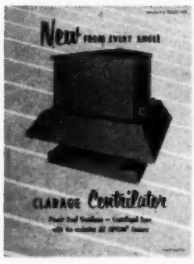
45—Cooling Tower Protection

"Protecting Cooling Tower Lumber by the MarTreat Process," 14-page technical bulletin R-54-W-1, takes the subject from a discussion of types of deterioration, to tests by Marley and other groups on durability of wood, to development of the MarTreat diffusion treatment for control of wood destroying fungi. *The Marley Co.*



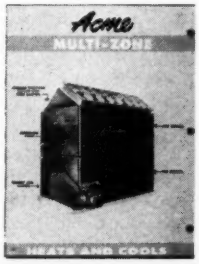
46—Snow Melting Systems

"Steel Pipe Snow Melting and Ice Removal Systems," 32 pages, presents the case for snow melting systems and shows typical installations in commercial and industrial locations. Design data is complete with information on anti-freeze mixtures, sizes, and spacing. *Committee on Steel Pipe Research, American Iron and Steel Institute.*



47—Centrifugal Roof Ventilators

The Clarage Centrilator, a new centrifugal type power roof ventilator with Jet Siphon, is introduced in four-page bulletin 550. High efficiency, low profile, and ruggedness of the units, making them adaptable for commercial and industrial installations, are featured. A condensed capacity table is provided. *Clarage Fan Co.*



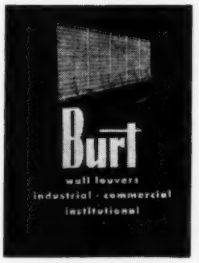
48—Multi-Zone Conditioners

The Acme Flow-Temp multi-zone conditioner, specifically designed for buildings in which heating and cooling are required simultaneously, is described in 12-page catalog 383. Tables give air friction, nominal capacities, humidifier capacities, total static pressure, general specifications, engineering data, and dimensions. *Acme-Industries, Inc.*



49—Power Roof Ventilators

Bulletin 3904, eight pages, describes the construction, operation, and design features of each of the four models in the improved line of American Blower power roof ventilators. Included are fan speeds and motor horsepower as well as certified delivery ratings up to ½ inch wg static pressure and other data. *American Blower Corp.*



50—Wall Louvers

Burt wall louvers for industrial, commercial, and institutional installations are featured in eight-page bulletin SPV-17. Dimensional and construction data are given for fixed and adjustable louvers and for operators and screens. Description of each type of louver is accompanied by a cross-sectional drawing. *Burt Mfg. Co.*



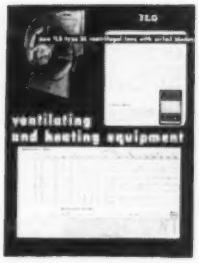
51—Fan Engineering Data

Bulletin A-108 has 16 pages of useful fan engineering data including fan laws and formulas; recommended air change and exhaust hood velocity tables; terms and definitions; handy conversion tables; discussions of noise levels, fan installation, and comparison of propeller fans and centrifugal blowers. *Hartzell Propeller Fan Co.*



52—Roof Ventilators

Penn Ventilator's complete line of powered and gravity roof ventilators and accessory products is shown in new eight-page bulletin NHS-57. It includes performance tables, dimensional charts, specifications, and construction details for over 15 different units for public, commercial, and industrial buildings. *Penn Ventilator Co.*



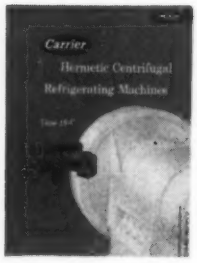
53—Air Conditioning Fans

Ilg type BC centrifugal fans with airfoil blades, aluminum sides and scroll, in both direct connected and belted models for ventilating and heating equipment, are illustrated and described in eight-page bulletin S-316. Performance, dimensions, and capacities are given for each type with detail drawings. *Ilg Electric Ventilating Co.*



54—Performance Tests

Publications 305-1 and 345-1 describe special performance tests and results reported on Nesbitt Series "T" Heating Surface with the Trombone Steam Distributing Tube. Tests conducted with sub-freezing entering air conditions under all degrees of modulated steam control proved uniform final temperatures. *John J. Nesbitt, Inc.*



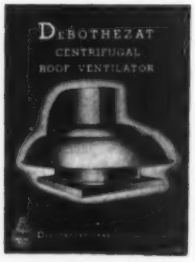
55—Refrigerating Machines

Type 19-C hermetic centrifugal refrigerating machines, with capacities of 90 to 350 tons, are detailed in 20-page bulletin 19C-100. Features are discussed, and engineering data, selection tables, dimensions, and elevation drawings are given. Nozzle arrangements and a schematic control diagram are included. *Carrier Corp.*



56—Industrial Air Filters

"The New Cambridge Aerosolve Air Filter," four-page folder, introduces a high efficiency, low pressure drop system of air filters designed for multi-filter banks in comfort and industrial ventilation or air conditioning supply systems. Filter characteristics, advantages, operation, and application data are given. *Cambridge Filter Corp.*



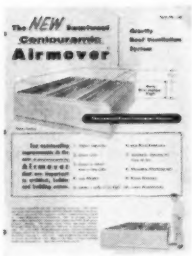
57—Centrifugal Roof Ventilators

This 16-page bulletin shows how and where to use DeBothezat centrifugal roof ventilators. It illustrates the fan's low silhouette, designed to blend with modern architecture, and describes the special fan wheel for quiet operation. It includes data on selection of the proper ventilator. *DeBothezat Fans Div., American Machine and Metals, Inc.*



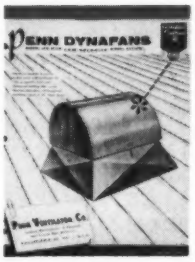
58—Direct Driven Fans

New LS type direct driven fans, offering better performance in the low static pressure ranges, are described and illustrated in four-page bulletin 775. Employing Macheta airfoil propellers, units are available in ring, square panel, or duct types, in sizes from 24 to 48 in. Ratings are included in table form. *Aerovent Fan Co., Inc.*



59—Gravity Roof Ventilators

The Swartwout Contouramic Airmover, a new extra-low roof ventilator of the extended heat valve type, is described in four-page bulletin 312. Application information, capacity, dimensions, and weights are included along with data on drainage, air flow, damper operation, and installation detail drawings. *The Swartwout Co.*



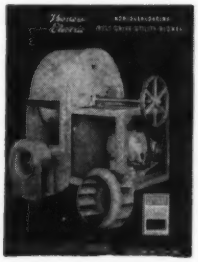
60—Ventilating Units

Eight-page bulletin PD-42 presents Penn Dynafans which feature a new low velocity wheel design, engineered to provide quiet-operating ventilation in direct and V-belt driven models for use in public, commercial, and industrial buildings. It includes dimensional charts, capacity ratings, and accessories. *Penn Ventilator Co.*



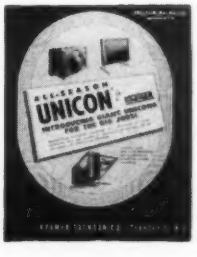
61—Liquid Chillers

Selection procedure to follow in specifying Acme Flow-Therm direct drive packaged liquid chillers for air conditioning, industrial cooling, and heat pump applications is detailed in 16-page catalog 533. Dimensions, capacities, water pressure drop data, condenser water requirements, and wiring diagrams are given. *Acme Industries, Inc.*



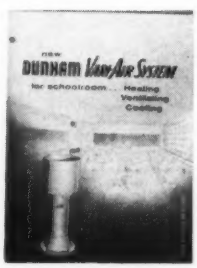
62—Backward Curve Blowers

Thirty-six page bulletin SDA-200 gives construction details; performance data; dimensions; discharge rotations; maximum duct velocities; rectangular equivalents of round ducts; applications; selection data; and construction features of Peerless non-overloading backward curve blowers which are NAFM approved. *Peerless Electric Co.*



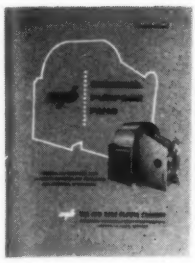
63—Air Cooled Condensers

Kramer's All-Season Unicon, a remote type air cooled condenser, is described in four-page bulletin U-210D, along with the All-Season Winterstat. It introduces the giant Unicons for big jobs and contains complete application information, specifications, and selection charts covering all sizes up to 300 tons. *Kramer Trenton Co.*



64—Schoolroom Ventilation

Special features, design, construction, and operation of Dunham-Bush's new Vari-Air System of schoolroom heating, ventilating, and cooling are illustrated and described in 12-page bulletin 2181. Cross sections of typical installations, plus selection, capacity, and adapter data and charts are included. *Dunham-Bush, Inc.*



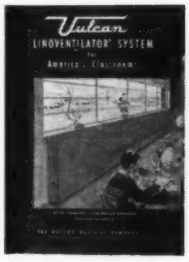
65—General Purpose Fans

Portable, self-contained general purpose fans of medium capacities for ventilating and industrial applications are covered in 12-page bulletin 563. Condensed capacity tables, fan dimensions, fan discharge views, and lists of material specifications are given, along with suggested applications for each type of unit. *The New York Blower Co.*



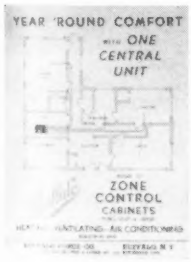
66—Roof Exhausters

Catalog 55-A, on the Jenn-Air belt driven roof exhausters, gives full data on a range of capacities from 1700 cfm to 13,400 cfm, and shows a cutaway drawing with a list of component parts of the exhauster. Recommended installation information is included, along with specifications and dimensions. *Jenn-Air Products Company, Inc.*



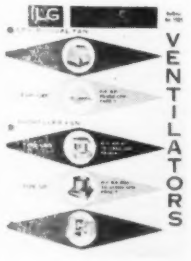
67—Heating and Ventilating

Catalog LV-400, eight pages, describes the Vulcan Linoventilator System for automatically controlled heating and ventilating of classrooms. Simplicity of operation and maintenance, flexibility of operation, and low initial and operating cost are stressed. Specifications and dimensional data are included. *The Vulcan Radiator Co.*



68—Zone Control Cabinets

"Year 'Round Comfort with One Central Unit," four-page bulletin AC-2500, describes the Model G Zone Control Cabinets, Types PCB and VPCB, for heating, ventilating, and air conditioning where one unit must provide air for several zones. Construction and operation are covered for manual and automatic control. *Buffalo Forge Co.*



69—Power Roof Ventilators

Power roof ventilators for all types of service are shown in eight-page bulletin 1905. Dimensions, sizes, and capacities are given for centrifugal and propeller fan units with exploded views, installation drawings, and suggested specifications. Design and construction features are explained in detail. *Ilg Electric Ventilating Co.*



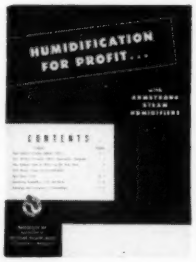
70—Roof Ventilators

Design and construction of Burt centrifugal roof fan ventilators are described in eight-page bulletin SPV 12-A. Dimensions and material gages, certified capacity ratings and net weights are in table form for easy reference. Typical specifications, cross-sectional drawings, and elevation drawings are included. *Burt Mfg. Co.*



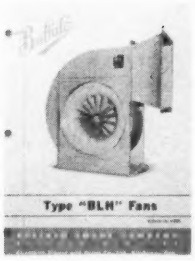
71—Rotary Blowers

Sectional views, typical installations, performance characteristics, specifications, and illustrations of large rotary positive displacement blowers and exhausters are contained in bulletin RB-154. Rotary, positive displacement blowers are available for 5 to 50,000 cfm, 1/5 to 10 psig pressure or equivalent vacuum. *Roots-Connersville Blower Div.*



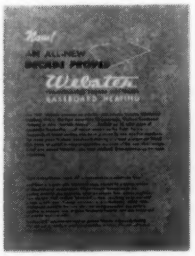
72—Steam Humidifiers

"Humidification for Profit," 16-page bulletin 500, presents statistics that show how relative humidity affects hygroscopic materials, health and comfort, and formation of static electricity. Schematic diagrams and sectional drawings demonstrate operation of electrically and air operated steam humidifiers. *Armstrong Machine Works.*



73—Heavy Duty Fans

Twenty-page bulletin F-200 covers the Type BLH heavy duty fans for industrial air handling for class II through IV service. Sketches and photos illustrate features of construction. Performance curves show horsepower savings possible. Outlet velocity tables are given for each size with selection data. *Buffalo Forge Co.*



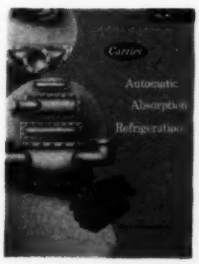
74—Baseboard Heating

The improved 1957 design of Webster Tru-Perimeter forced hot water baseboard heating is described in four-page folder C-680F. Simplified installation, lower cost, and improved appearance are pointed out. Cross sections, installations drawings, and approved ratings for steam and hot water heating are given. *Warren Webster & Co.*



75—Propeller Fans

Bulletin A-109 gives descriptions, specifications, dimensions, and performance data on Hartzell's line of propeller fans for industrial ventilation. This 40-page bulletin covers standard, Lo-Noise, and high pressure fans; direct drive, belt driven, and bi-pass duct fans; unit heaters; and other ventilation equipment. *Hartzell Propeller Fan Co.*



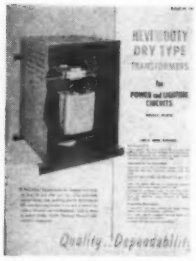
76—Refrigeration

"Automatic Absorption Refrigeration," 36-page catalog 16C-8, explains operation of equipment that utilizes low pressure steam to produce refrigeration. Costs are compared with those for conventional refrigeration systems, and typical installations are shown. Ratings, dimensions, a selection example, and elevations are given. *Carrier Corp.*



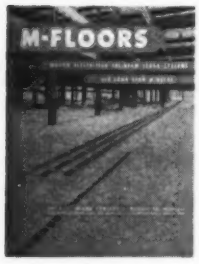
77—Wiring Devices

Catalog 60, 90 pages, contains information on Pass & Seymour's complete line of wiring devices. All types are illustrated, and specifications and features are explained in detail. An index and price schedule are included for switches, wall plates, lampholders, outlets, connectors, grounding devices, and allied products. *Pass & Seymour, Inc.*



78—Transformers

Bulletin 100, four pages, contains in table form statistical information on capacities, prices, approximate dimensions, temperature rise, and weight of the entire line of single phase power and lighting transformers made by Hevi-Duty. Dimensional drawings and photos are given for each type of unit. *Hevi-Duty Electric Co.*



79—Electrified Floor System

Mahon electrified Cel-Beam floor systems and Long Span M-deck designed to safeguard buildings against electrical obsolescence are detailed in new 24-page bulletin M-57. Use with concrete topping and floor covering, use for ceilings, fire resistance ratings, engineering data, and load and property tables are given. *The R. C. Mahon Co.*



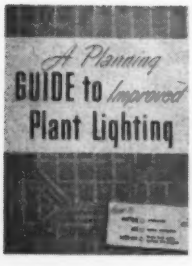
80—Generator Voltage Control

Rocking contact voltage regulators, Type JB1/1, for medium and medium-large a-c generators are described in 12-page booklet P 08-3095. Specifications and special features, theory of operation, sensitivity, application, parallel operation, and, compounding are discussed and outline and mounting diagrams given. *Brown Boveri Corp.*



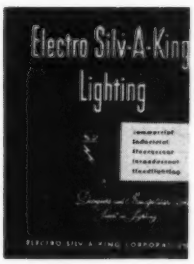
81—Luminaires

Eight-page File No. 2 features the Guth Slimlux line of luminaires, the shallow depth fixture for close ceiling mounting. It includes all necessary lighting data, such as coefficients of utilization, distribution curves, dimensions, and installation data. Units are 2 or 4 light width, in either 4 or 8 ft lengths. *Edwin F. Guth Co.*



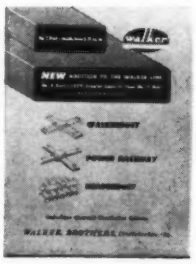
82—Plant Lighting

"Planning Guide to Improved Plant Lighting," 32 pages, presents planning information for better industrial lighting. It covers such subjects as objectives, steps to take, selection of proper lighting system, equipment considerations, engineering and layout data, drawings, typical problems, and charts and tables. *Benjamin Electric Mfg. Co.*



83—Lighting Fixtures

This large new catalog gives you complete photometric, installation, and construction data on a comprehensive line of lighting fixtures; fluorescent commercial; and fluorescent, incandescent, floodlighting, and mercury industrial lighting. Dimensional drawings, specifications, and suggested arrangements are given. *Electro Silv-A-King Corp.*



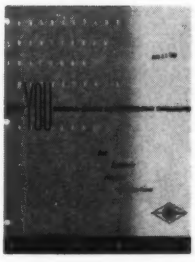
84—Electrical Duct Systems

Eight-page condensed catalog 756 describes Walker underfloor electrical distribution systems — Walkerduct, power raceway, and Headerduct. It covers the No. 2 duct with an inside area of 3.31 sq in.; the new addition to the line, the No. 4 duct with an inside area of 8.75 sq in.; and combination systems. *Walker Brothers.*



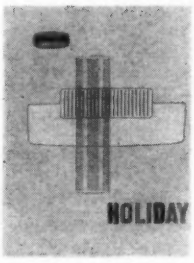
85—Electromagnetic Controls

"Electromagnetic Control by ASCO," 150-page catalog, is indexed to provide an easy means of finding design engineering data on automatic transfer switches, remote control switches, contactors, relays, solenoids, and electric plant controls. You will want this bulletin for your permanent reference file. *Automatic Switch Co.*



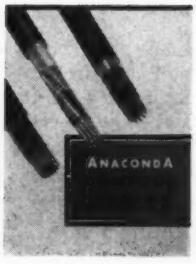
86—Branch Circuit Protection

"What You Should Known About Circuit Breakers for Branch Circuit Protection," 16-page manual 101, explains ways of protecting your client from fire, equipment damage, excessive wiring costs, needless interruptions, and wasted time. How fully magnetic circuit breakers provide this protection is pointed out. *Heinemann Electric Co.*



87—Rapid-Start Light Fixtures

Folder OD-660 features the Holiday, a recently introduced two-lamp rapid-start fixture for offices, libraries, stores, and other commercial type locations. It contains illustrations, application drawings, explanatory text, and lists features of the fixture. Light distribution pattern and coefficients of utilization are given. *Day-Brite Lighting, Inc.*



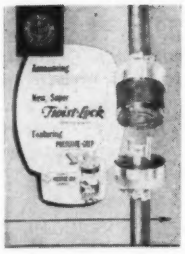
88—Control Cables

Bulletin DM-5705, 20 pages, provides complete information about Anaconda control cables. Construction details concerning both rubber and thermoplastic types are included. Full coverage is given to the applications and wide industrial usage of control cable with a selection chart to assist in making a choice. *Anaconda Wire & Cable Co.*



89—Radiation Enclosures

Vulcan finned-tube Linovector radiation enclosures, covers, and elements for factories, schools, hospitals, office buildings, churches, and stores are described in 32-page catalog 625 B. Ratings, dimensional data, correction factors for non-standard steam pressures and temperatures, and pipe size tables are given. *The Vulcan Radiator Co.*



90—Electrical Connectors

Four-page bulletin announces and describes in detail the new Super Twist-Lock line. Diagrammatic drawings and illustrations show how the new units are designed with dead front, two piece cap, and screwless terminals. Six simple wiring steps, that cut wiring time up to one third, are illustrated and explained. *Harvey Hubbell, Inc.*



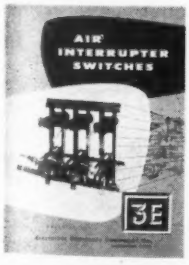
91—RLM Specifications

This new edition of the "RLM Standard Specifications for Industrial Lighting Units" includes newly revised light distribution curves on RLM direct and semi-direct fluorescent lighting units. Most important changes and additions are new coefficient of utilization tables for eight incandescent and fluorescent units. *RLM Standards Institute.*



92—Control Centers

Catalog SM-244, 16 pages, describes in detail the modern method for centralizing electrical power distribution and motor control equipment for industrial applications. It also contains suggested ideas for control specifications, and gives a simplified selector for use in control center layout and planning. *Square D Company.*



93—Air Interrupter Switches

Bulletin 152 lists and illustrates a complete line of dry-type and liquid-filled switches through 14.4 kv. Units offer Auto-Speed interruption and automatically produced interruption that occur at the same point in the switching operation and take ½ cycle. Ratings, dimensions, and specifications are given. *Electrical Engineers Equipment Co.*



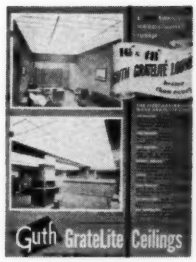
94—Dry-Type Transformers

"Latest Development in Dry-Type Transformers," eight-page bulletin 155, gives typical applications, sizes and types, construction, and specifications for air-cooled, dry-type transformers, both standard and custom-built. Photos and short descriptions are included for many of the types of transformers and accessories. *Sorgel Electric Co.*



95—Area Illumination

"Area Illumination," eight-page booklet 610A, contains case histories of lighting installations showing how this type of lighting provides almost unlimited freedom of selection of size, pattern, intensity, shielding, and periphery. Preliminary procedure for layout and detail drawings are given. *Smithcraft Lighting Division.*



96—Over-all Ceiling Lighting

This packet of two and four page brochures features the Gratelite Louver Diffuser for over-all ceiling lighting. It includes full installation, performance, and construction data; description of the new Una-Tee suspension system; time-saving estimating tables; and Gratelite ceiling layout information. *Edwin F. Guth Co.*



97—Layout Manual

This 67-page manual, specifically intended for the consulting engineer, consists entirely of layout arrangements, bussing diagrams, conduit entrance data, description of construction and arrangement, and suggested specifications. It covers switchboards most suitable for requirements between 400 and 2000 amp. *Square D Company.*



98—Transformers and Substations

Twelve-page bulletin 655 describes construction and advantages of the Sorgel load center dry-type and Askarel-cooled transformers—units that can be installed in buildings without fireproof vaults. Substations embodying these transformers and supplied with various types of primary and secondary switchgear are discussed. *Sorgel Electric Co.*



99—Disconnectors

Bulletin 140, 36 pages, describes 3E Isolators for disconnecting equipment and cables, in ratings up to 15,000 v and 1200 amp. It lists points to be considered when ordering, shows the units in typical applications, and gives dimensional drawings, cutaways, and specifications for the various types. *Electrical Engineers Equipment Co.*



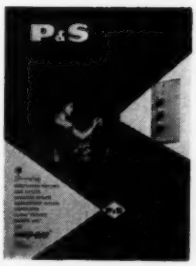
100—Electrical Connectors

New four-page folder 30b/Hu presents the complete Hubbell Twist-Lock line, including Super Twist-Lock (3000 series); the Regular Twist-Lock in all sizes, types, and ratings; and Insulprene Twist-Lock rubber connector bodies. Bulletin is designed for easy reference by consulting engineers, giving ratings and dimensions. *Harvey Hubbell, Inc.*



101—Bus Duct Manual

"Bus Duct Manual," 72-page bulletin B-4272B, is designed for consultants' use in planning and selection of units for bus duct layout in commercial, institutional, and industrial buildings. Plug-in duct, weather-proof feeder duct, low-impedance duct, and weather-proof low-impedance duct are fully covered. *Westinghouse Electric Corp.*



102—Wiring Devices

P & S modern wiring devices — specifications switches, plug outlets, grounding outlets, weatherproof outlets, lampholders, Alabax fixtures, the Despard line of wiring devices, and Roto-Glo quiet switches — are detailed in this eight-page bulletin. Ratings, dimensions, and drawings are given for each item. *Pass & Seymour, Inc.*



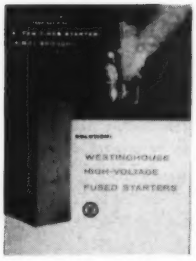
103—Corrosion-Proof Motors

"Corrosion-Proof, From Core to Cover," eight-page bulletin B-2406, outlines the special construction features of Reliance Electric corrosion-proof motors, 1 through 150 hp, 2 or 3 phase, 60 cycle, 220 through 2300 v. Protection of all internal mechanical and electrical parts is pointed out by means of drawings. *Reliance Electric and Engineering Co.*



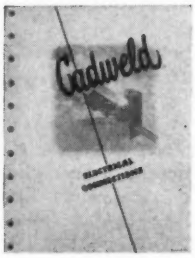
104—Cathodic Protection

Cadweld connections for cathodic protection are described in four-page folder 549-2. Included are specification tables, drawings, and directions for ordering and installation of formed terminal connections and anode lead connections. How copper is welded to either copper or steel without heat is explained. *Erico Products, Inc.*



105—Fused Starters

"For industrial high-voltage systems a 'ten times starter' is not enough," according to 12-page booklet B-6535. It tells how high-voltage, fused starters give protection to the system, personnel, and motors. Horsepower ratings and representative types of starters available for a-c motors are listed. *Westinghouse Electric Corp.*



106—Electrical Connections

Cadweld process described in 76-page electrical connection catalog is a method of welding copper to copper or steel without an outside source of heat. Equipment to form many types of electrical connections is described. Types of connections include cable, ground rod, horizontal and vertical surface, rail bonds, and studs. *Erico Products, Inc.*



107—Lamp Ballasts

This fluorescent lamp ballast buyer's guide includes information on newly designed fluorescent lamp ballasts with smaller cross section dimensions, greater efficiency, and quieter operation. The bulletin describes core and shell laminations, coils, capacitors, and cases. Dimensions and specifications are given. *Advance Transformer Co.*



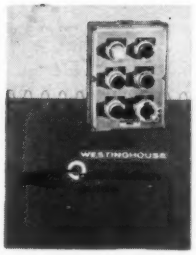
108—Control Centers

"Westinghouse Control Centers," 32-page bulletin, analyzes advantages gained with control centers in small shops with a few motors, office buildings, stores, power plants, and in large industries. Charts and tables are included to help you select the proper control center arrangement for the job. *Westinghouse Electric Corp.*



109—High Speed Circuit Breakers

Six-page bulletin 3004-A contains descriptive and technical information about the FB line of high speed, current limiting d-c circuit breakers. Principal applications of these breakers are for generators, motors, anode protection, and as feeder breakers. Wiring diagrams and outline drawings are included. *I-T-E Circuit Breaker Co.*



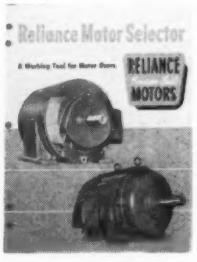
110—Pushbutton Guide

Bulletin B-6749 is a complete 76-page guide containing illustrations, application data, dimensions, and prices of a complete line of industrial pushbuttons. Whether the application calls for standard duty, heavy duty, Oil-tite, or special service control stations, this easy-to-read catalog will give the answer. *Westinghouse Electric Corp.*



111—Ballast Reference Guide

"Advance Fluorescent Lamp Ballast Cross Reference Guide" is a handy wall chart with comparative data on lamp ballasts manufactured by Advance Transformer and other manufacturers. It matches the catalog numbers of the Advance ballasts and the catalog numbers of other manufacturers' products. *Advance Transformer Co.*



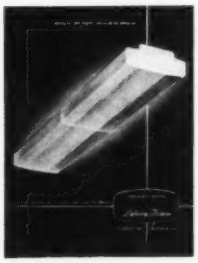
112—Motor Selector

"Reliance Motor Selector," 12-page bulletin B-2103-1, is a working tool for engineers specifying a-c motors, for general or special services. It lists speed-frequency relationship, explains design classes, lists current and torque values and frame sizes, and gives suggested applications for each motor type. *Reliance Electric and Engineering Co.*



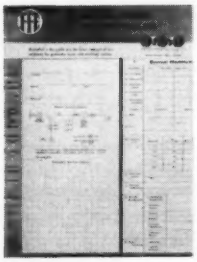
113—Products Guide

This 16-page bulletin contains descriptive data on major products manufactured by I-T-E, such as: power switching equipment, metal-enclosed bus, metal-clad and low voltage metal-enclosed switchgear, unit substations, air circuit breakers, network analyzers, mechanical rectifiers, and porcelain insulators. *I-T-E Circuit Breaker Co.*



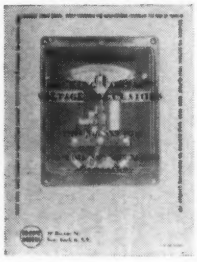
114—Lighting Fixtures

Bulletin OD-663, 16 pages, covers a cross section of the Day-Brite line of fluorescent and incandescent lighting fixtures, including fluorescent units for stores, offices, schools, and industry, and incandescent accent and special purpose units. Each is illustrated and shown in dimensioned cross section. *Day-Brite Lighting, Inc.*



115—Planning Guide

Eight-page bulletin 10004-B gives complete information on how to plan and specify isolated phase bus for generator leads and switching stations. It contains the latest data on the new telescoping cover construction. This is a companion bulletin to comprehensive 28-page bulletin 10004-A on metal-enclosed bus. *I-T-E Circuit Breaker Co.*



116—Voltage Regulators

Types JS1/1 and JSG1/1 rocking contact voltage regulators for small and medium-sized a-c generators are described in 14-page bulletin P 08-3090. Connection diagram, outline and mounting drawing, and application chart are given. The booklet is indexed for easy reference and carries complete specifications. *Brown Boveri Corp.*



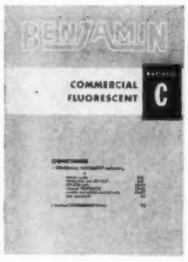
117—Troffers

Bulletin 430C, 36 pages, describes the refinements and details the features of Smithcraft troffers for dry type ceilings, wood framed structures, and other ceiling systems. Dimensional data, pattern arrangements, types of shielding media, candlepower distribution tables, and coefficients of utilization are covered. *Smithcraft Lighting Division.*



118—Low Voltage Switchgear

Bulletin 6004-B, 12 pages, describes I-T-E low voltage metal-enclosed drawout switchgear, indoor and outdoor, incorporating type K and LG circuit breakers. Ratings are through 600 v, 6000 amp continuous, and 15,000 amp interrupting. Also included are basic standard arrangements. *I-T-E Circuit Breaker Co., Switchgear Div.*



119—Lighting Equipment

Bulletin C, 52 pages, presents the newest, most modern lighting equipment for stores, offices, and schools. It includes descriptions of Multivent Troffers which deliver light and air conditioning from one unit; Capri luminous indirect fixtures; Sky-Liter units with four distinctive panel designs, and other types. *Benjamin Electric Mfg. Co.*



120—Circuit Breakers

Bulletin 3101, eight pages, covers Magnette fully magnetic, non-thermal circuit breakers suitable for use in apartment buildings, theaters, hotels, offices, stores, schools, and factories. Suggested specifications, advantages, important features, dimensional drawings, and ratings are given for various models. *Heinemann Electric Co.*



121—Troffers

Magic Frame troffers are described in 12-page bulletin TRM. The three parts of the troffer are illustrated, giving reasons why the troffer is efficient, flexible, and economical to install. Complete photometric, installation, and construction data are given, plus information on shallow troffer, plastic frames, and spot boxes. *Electro Silv-A-King Corp.*



122—Armor Cables

Bulletin DM-5606, 16 pages, describes Anaconda's line of Duralox interlocked armor cables. In addition to information relative to applications, construction details, electrical characteristics, and operating advantages, it explains how these products are installed, jointed, and terminated, and illustrates, uses. *Anaconda Wire & Cable Co.*



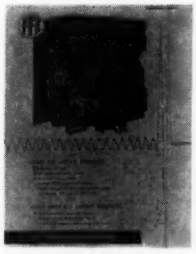
123—Electrical Machinery

"Catechism of Electrical Machinery," 48-page bulletin E100M, presents the most important theoretical and practical features of the common types of d-c and a-c motors, generators, and control equipment. Text is illustrated with Fairbanks-Morse machinery with explanation of operation and construction. *Fairbanks, Morse & Co.*



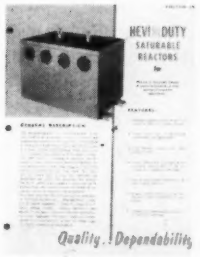
124—Electrical Equipment

Catalog 354R, 56 pages, presents detailed information on Walkerduct and Walker Flushduct systems. It includes design data and a guide to the selection of systems for various types of building construction, along with descriptions of steel raceways and copper conductors for all industrial electrical requirements. *Walker Brothers.*



125—Large Air Circuit Breakers

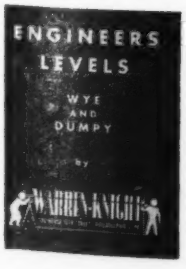
Six-page bulletin 1004-A describes the I-T-E, K Line circuit breakers. It includes manually and electrically operated circuit breakers to be applied as switchboard breakers, individually enclosed breakers (Urelites), and one-high individually enclosed drawout units. Data is given on heavy duty d-c breakers. *I-T-E Circuit Breaker Co.*



126—Saturable Reactors

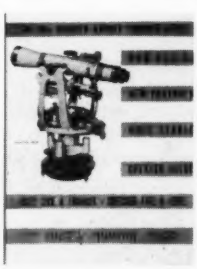
Hevi-Duty Saturable Reactors for manual or automatic control of power to a load are described in four-page bulletin 500. Suggested uses include stepless control of electrically heated equipment, reduced voltage in a-c motor starting circuits, and as loading reactors for test boards. Dimensions are given. *Hevi-Duty Electric Co.*

ENGINEER'S OFFICE EQUIPMENT



127—Levels

"Engineers' Levels," four-page folder 1819, includes illustrations and descriptions of both Wye and Dumpy levels. It gives complete specifications so that you can tell at a glance how useful the instruments can be to you. Both types are available with or without a reversible mirror. Prices are included for both. *Warren-Knight Co.*



128—Transit-Levels

The two exclusive features of the Warren-Knight Transit-Level — adjustment in the same manner as Wye level and horizontal limb verniers that read to one minute are presented in six-page folder A 19807. The ten day free trial offer is explained and price with and without an attached compass is listed. *Warren-Knight Co.*

HEAT EXCHANGERS AND WATER HEATERS



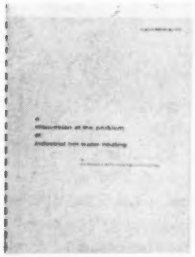
129—Heat Exchangers

Bulletin 132 describes the new panel casing construction method that makes the Aero Heat Exchanger fully accessible for cleaning and saves your client expense in shipping and installation. This is a self-contained cooling system for water, oils, and solutions that replaces cooler and cooling tower. *Niagara Blower Co.*



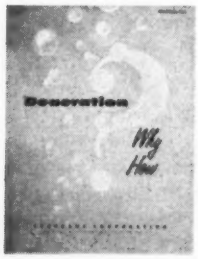
130—Convertors

Twelve-page catalog 6001 describes the P-K Type "DW" convertor and water heater, which employs forced circulation of boiler water and is designed for use below the water line of a steam boiler or with a heating boiler. Heating capacities of from 2.2 to 380 gpm are available, ASME or non-ASME. *Patterson-Kelley Co., Inc.*



131—Industrial Water Heating

"A Discussion of the Problem of Industrial Hot Water Heating," 12-page technical bulletin 923, covers some of the major problems encountered and explains how Schaub's Iso-Therm hot water heating system overcomes these problems. Diagrams and question-answer format help to shed light on subject. *Fred H. Schaub Engineering Co.*



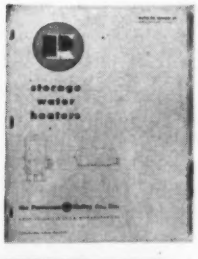
132—Deaerators

Literature on various types of deaerators is offered in five sections, starting with the "Why and How" of deaeration (4650). The others deal with Jet Tray Deaerators (4651); Tray Type Deaerators (4652); Cold Water Deaerators (4653); and Surface Type Deaerating Hot Water Heaters (4654). *Cochrane Corp.*



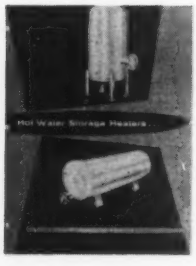
133—High Pressure Closures

Bulletin 5.6K1, four pages, describes high pressure closures for Ross feedwater heaters and other high pressure, high temperature exchangers. Design details are illustrated by photos and cross sections. Text discusses simplicity of design, safety factor, and ease of removal. *Ross Heat Exchanger Div. of American-Standard.*



134—Storage Water Heaters

"Storage Water Heaters," 48-page catalog 19, gives construction details, storage and heating capacities, dimension tables, and standard specifications for steel, copper-lined, copper silicon, cement-lined, clad-galvanized, and Lo-Flo storage water heaters. Typical piping diagrams are included for easy reference. *Patterson-Kelley Co., Inc.*



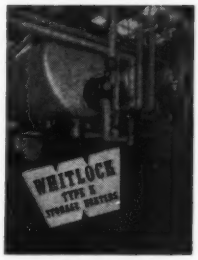
135—Storage Heaters

"Reco Hot Water Storage Heaters," 18-page bulletin 512, covers both horizontal and vertical heaters, submerged water heaters, and condensate coolers and economizers. It gives specifications, construction details, dimension and installation diagrams, capacity and dimension charts, and lists special alloys. *Richmond Engineering Co., Inc.*



136—Hot Water Heaters

Method of operation of the Pick instantaneous steam injection hot water heater is detailed in 12-page bulletin. A list of operating requirements, specifications, a capacity chart, drawings of various types of installations, engineering data, dimensions, and photographs of typical applications are given. *Pick Mfg. Co.*



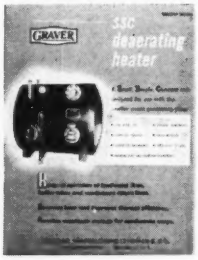
137—Storage Heaters

Bulletin 40B, 16-pages, has been written to facilitate selection of Type K Storage Heaters for conditions normally found in buildings of various classifications. Typical layouts are included along with tables of pressure thickness, vertical and horizontal storage heater dimensions, and capacities. *Whitlock Mfg. Co.*



138—Preheater for Small Boilers

The important points to consider in selecting a preheater for use with small boilers (25,000 to 125,000 lbs per hr) are discussed in four-page bulletin on the new package Ljungstrom air preheater. How use of a preheater saves fuel, increases boiler output and reliability, and permits use of lower grade fuels is explained. *Air Preheater Corp.*



139—Deaerating Heaters

Bulletin WC-118 describes the Graver SSC deaerating heater specifically designed for use in smaller steam generating plants where economy of operation, low initial cost, and minimum space requirements are of prime importance. It includes photos, cross sectional diagrams, sizing charts, and capacities. *Graver Water Conditioning Co.*



140—Corrosion Resistant Linings

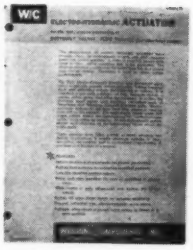
"Special Corrosion Resistant Linings for Hot Water Storage Tanks and Heaters," four-page folder 514, describes plastic coatings and linings, cement linings, clad steel, and galvanizing for hot water storage tanks and heaters. Suggested uses for each type of lining are listed with advantages. *Richmond Engineering Co., Inc.*



141— Convertor Rating Tables

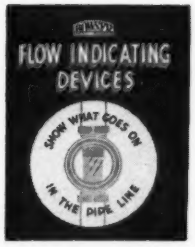
Bulletin 62, 16 pages, has been designed in answer to the need for convertor rating tables that are accurate and arranged for rapid and easy reading. At least three Type R U-tube Convertor sizes are listed for each set of operating conditions, depending on pressure drop limitations. Booklet is indexed for quick reference. *Whitlock Mfg. Co.*

To order personal copies of these bulletins, please fill out the card between pages 2 and 3 or 34 and 35.



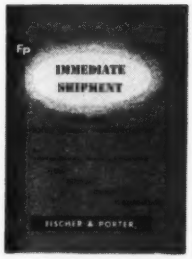
142—Actuators

Bulletin 22 describes a positional control for actuation of butterfly valves, control valves, and dampers. The actuator utilizes the electrical input signal from standard controllers and has linear stroke to 100,000 ft lb, full stroke in 1 sec, frequency response flat to 5 cps. Complete specifications are given. *Weighing Components, Inc.*



143—Flow Indicators

Bowser flow indicating devices for many industrial in-plant or process systems are illustrated in a broad size range with complete data, including specifications and dimensions for easy reference. Each product is pictured and described with suggested applications, sizes, and types listed. *Bowser, Inc.*



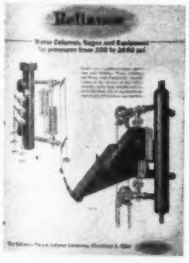
144—Process Instrumentation

Catalog 2, 32 pages, describes Fischer & Porter process instrumentation available for immediate shipment. It includes prices, ratings, materials of construction, dimensions, and capacities for indicating, recording, controlling, and transmitting instruments for flow, pressure, density, and chlorination uses. *Fischer & Porter Co.*



145—Instrument Accessories

Bulletin 600 describes accessories for various types of gages, dial thermometers, and recorders, including attachments for protection of instrument internals against corrosive media and pulsations in pressures. It also shows ring for panel mounting of turret case instruments. *U.S. Gauge Div. of American Machine and Metals, Inc.*



146—Columns and Gages

Water columns, gages, and equipment for pressures from 250 to 2500 psi are each briefly described in four-page catalog 500, Sec. BO. Cutaway views explain operation, construction, and advantages of each item. Equipment is also shown for replacement and modernization of existing boiler installations. *The Reliance Gauge Column Co.*



147—Specific Gravity Indicator

Four-page technical bulletin 7004 describes the operation, design, and construction of the new remote reading Specific Gravity Indicator 1561, an automatic, direct reading, non-mechanical instrument, accurate to 0.001 unit of specific gravity. Easy installation and maintenance features are illustrated and discussed. *Petrometer Corp.*



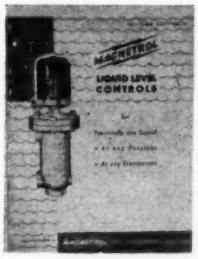
148—Compression Tester

Bulletin AP-350 illustrates and describes the Versa-Tester, a multi-purpose compression testing machine ideal for research or routine laboratory testing. Accurate tests requiring capacities to 30,000 lb can be performed simply and quickly on soils, bituminous materials, mortar, concrete, plastics, metals, and wood. *Soiltest, Inc.*



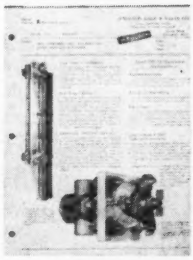
149—Liquid-Level Alarms

A series of four Levalarms, liquid level alarms and fuel cut-outs, is described in four-page bulletin D2. The bulletin explains principle of operation — water conduction between electrodes of varying lengths—how the units can be used with relays to provide alarm actuation, fuel cut-out, or pump start-stop control. *The Reliance Gauge Column Co.*



150—Liquid Level Controls

Catalog section I describes the foolproof switch mechanism operation of Magnetrol liquid level controls. It covers operation and construction of ten representative types of controls for almost any liquid, at any pressure and temperature. The units are available for electric or pneumatic operation. *Magnetrol, Inc.*



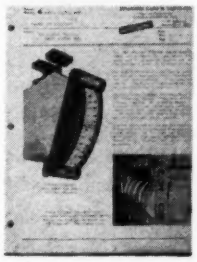
151—Illuminators

This data sheet, No. 300, points out that the new Jerguson EPL-56 Illuminators offer three times the illumination formerly available, as well as three times the bulb life. A complete bill of materials is given along with a cutaway view, dimensions, operation, construction, and optional features that are available. *Jerguson Gage & Valve Co.*



152—Temperature Regulators

OPW-Jordan sliding gate self-operating temperature regulators for control of temperatures in ventilating and processing systems are detailed in four-page bulletin J-180. Tables list steam requirements, steam capacities, and water capacity. Drawings show use with heaters, cooling jackets, and steam tables. *Jordan Corp.*



153—Remote Reading Gages

Jerguson inclined Truscale remote reading gages, designed for use where gages must be mounted high or low on the instrument panel, are described in data sheet No. 291. For high installation the case is built so that the cover and scale incline downward; for low installation, so that they incline upward. *Jerguson Gage & Valve Co.*



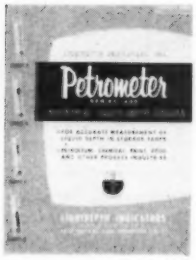
154—Bi-Color Gage

Advantages gained by use of Diamond's Multi-Port Bi-Color Gauge on new or old boilers with design pressures up to 900 psig are pointed out in four-page folder 2044: high availability, lower maintenance, shorter warm-up time, and excellent readability. Sectional views and cutaways show construction. *Diamond Power Specialty Corp.*



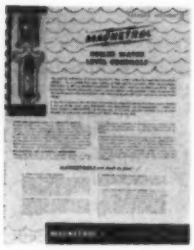
155—Density Tester

Bulletin CN-980 contains complete information on the new Volumeasure, a self-contained, lightweight, and accurate unit designed for fast and simple field or laboratory in-place density tests of soils. The unit provides a positive test method for use in embankment control and subgrade compaction projects. *Soiltest, Inc.*



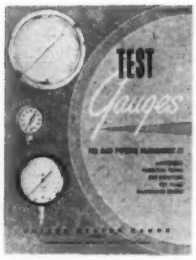
156—Industrial Tank Gages

Bulletin 6004 describes a new line of remote reading Industrial Liquid Depth Gauges. It presents comprehensive information on operation and design of the Petrometer Series 1400 Gauges, as well as on the method of selecting the right gage for remote indication of depth or quantity of liquids in tanks and pressure vessels. *Petrometer Corp.*



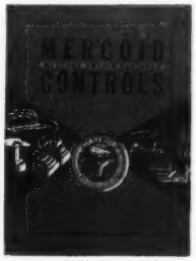
157—Boiler Water Level Controls

Four-page catalog section III deals with the use of Magnetrol boiler water level controls for protection of equipment. Single stage, standard multi-stage, and combination water column and level control units are illustrated and described. Construction of each type, its characteristics, and typical applications are discussed. *Magnetrol, Inc.*



158—Test Gage Catalog

Eight-page bulletin 400 deals with selection of test gages for fluid pressure measurement in laboratories, production testing, field inspections, test stands, and recalibration benches. It provides a list of check points for ordering gages, and suggests applications for each. *U. S. Gauge, Div of American Machine and Metals, Inc.*



159—Heating and Cooling Controls

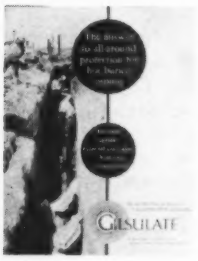
Mercoid automatic controls for heating, refrigeration, air conditioning, and industrial applications are described in 56-page catalog 857. The booklet is completely indexed by subject and catalog number and gives all pertinent engineering data, specifications, dimensions, ranges, and temperature and pressure charts. *The Mercoid Corp.*

INSULATION



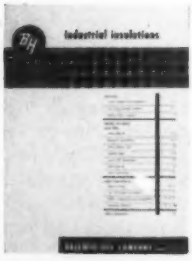
160—Duct Insulation

Johns-Manville Spintex, a spun fiber insulation for air-conditioning ducts, is described in six-page folder IN-177A. Applications for flexible, semi-rigid, and rigid types are pictured. Standard sizes, thicknesses, and facings are listed along with data on special facings and physical and thermal properties. *Johns-Manville Corp.*



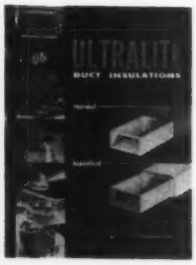
161—Underground Pipe Insulation

Four-page brochure L-102-F-56 discusses the problems of underground pipe insulation and explains how Gilsulate's special properties overcome them. On-the-job photos illustrate ease and speed of application. Thermal coefficients of transmission and other technical data and specifications are given. *American Gilsonite Co.*



162—Industrial Insulations

Baldwin-Hill products for industrial insulation: cements; blocks, blankets, and felts; pipe insulations; and duct and special insulation products are described in this 20-page bulletin. Recommended thicknesses and thermal conductivity charts are included, along with photographs and drawings of typical applications. *Baldwin-Hill Co.*



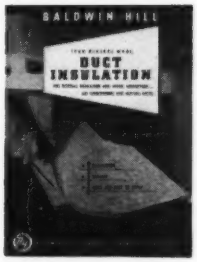
163—Duct Insulations

"Ultralite Duct Insulations," eight-page bulletin, describes thermal and acoustical properties of Ultralite glass fiber duct insulations. Application data cover: wrap-on thermal insulation of heating, cooling, combination, and ventilating duct, with surface finishes listed. Sound absorption coefficient charts are given. *Gustin-Bacon Mfg. Co.*



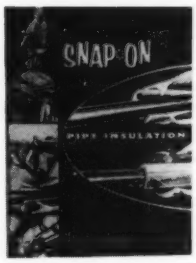
164—Industrial Insulation

"Industrial Insulations Manual," 130-page book IN6.M1, 2nd ed., is a carefully indexed publication containing product and specification information on the complete line of Fiberglas pipe, duct, industrial equipment, and cold storage insulations for work in the temperature range from –100 F to 1800 F. *Owens-Corning Fiberglas Corp.*



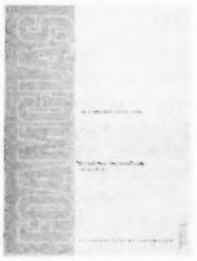
165—Mineral Wool Insulation

Spun mineral wool duct insulation for thermal insulation and sound absorption for air conditioning and heating ducts is presented in four-page folder E-229-56. Thermal efficiency, sound absorption, maximum temperatures, density, moisture resistance, and workability are discussed, along with various methods of application. *Baldwin-Hill Co.*



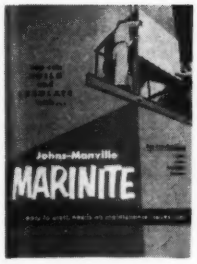
166—Pipe Insulation

"Snap*On Pipe Insulation," eight-page booklet, describes characteristics and application data for one piece, fine-glass pipe insulation. Application specifications cover: plumbing, heating, insulation of valves and fittings, cold piping, and dual temperature outdoor piping. Charts show recommended thicknesses. *Gustin-Bacon Mfg. Co.*



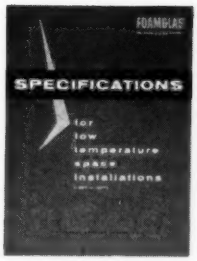
167—Building Insulation

The 1957 edition of the 24-page booklet "Foamglas Building Insulation" is intended as both catalog and reference manual. It contains complete data on the latest recommended procedures for application of Foamglas cellular insulation on flat roofs, pitched roofs, parking decks, curtain walls, and perimeters. *Pittsburgh Corning Corp.*



168—Insulating Sheets

You can cut costs by specifying building and insulating (up to 900 F) in one operation with Marinite, the fireproof, non-corroding insulating sheet material described in 16-page booklet IN-153A. Construction details are given for sidewall, ceiling, and corner designs and doors. Physical and thermal properties are listed. *Johns-Manville Corp.*



169—Refrigeration Insulation

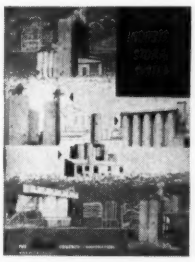
"Specifications for Low Temperature Space Installations," 20 pages, contains latest recommended methods for installing Foamglas cellular glass insulation on walls, floors, ceilings, and roofs of refrigerated spaces operating between -50 and 50 F. It lists suggested thicknesses, adhesives, finishes, and paints. *Pittsburgh Corning Corp.*

MATERIALS HANDLING AND STORAGE



170—Automatic Feeders

Bulletin 253, 16 pages, discusses the application of the Merrick Model WS Feedoweight — a self-contained automatic, continuous gravimetric feeder for blending, proportioning, or feeding of granular materials to process by weight. Specifications, drawings, and capacities are given for left and right-hand assembly. *Merrick Scale Mfg. Co.*



175—Industrial Storage Silos

"Modern Industrial Storage Systems," 12-page brochure 4393, discusses the subject of storage for raw ingredients, semi-processed, or finished material. The flexibility and adaptability of concrete silos is discussed. Descriptions of component parts and construction are supplemented with line drawings. *The Marietta Concrete Corp.*



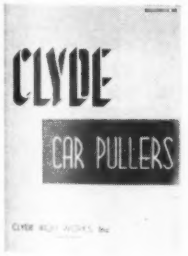
171—Electric Hoists

Featured in four-page bulletin H-44 is the complete line of P & H electric hoists, including condensed specifications and specially prepared cutaway photos of the complete Hevi-Lift and Zip-Lift Hoist Line. The new P & H control cabinet, redesigned to better meet users' needs, is described in detail. *Harnischfeger Corp.*



176—Conveyor Scales

"Weight at a Glance," 22-page bulletin 375, contains complete specifications, drawings, and illustrations of the Merrick Model E Weightometer — a fully automatic conveyor scale for continuous weighing of material passing over an existing belt conveyor. Other types of automatic weighing machines are described. *Merrick Scale Mfg. Co.*



172—Car Pullers

Ten-page bulletin L-6 shows capstan type car puller for moving cars a short distance using manila rope. Three styles of drum car pullers for heavy duty car moving, shuttle work, or for servicing very large areas are also listed, as well as barge movers for shifting barges back and forth during unloading. *Clyde Iron Works, Inc.*



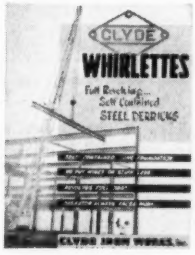
177—Stepless Crane Control

Principles of operation of the new P & H electronic stepless control for overhead traveling cranes are discussed in four-page bulletin C-53. Applied in conjunction with the standard P & H Magnetorque, this control is said to provide an ultimate in control and precision spotting in both lowering and hoisting. *Harnischfeger Corp.*



173—Tubular Conveyors

This new catalog presents numerous examples of the use of Hapman Tubular Conveyors in all types of industries for moving flowable materials — wet and dry — through any plane or angle. Weight-volume-time conversion chart, conveyor capacity chart, suggested applications, and specifications are given. *Hapman Conveyors, Inc.*



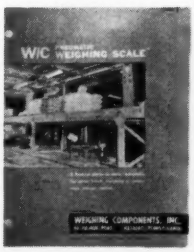
178—Steel Derricks

Advantages gained by using Whirlettes — full revolving, self contained steel derricks — are listed in four-page folder MP-49. The hoist is mounted on the rotating structure and only one foundation is necessary. No guy lines or stiff legs are required. Booklet gives specifications, and illustrates typical uses. *Clyde Iron Works, Inc.*



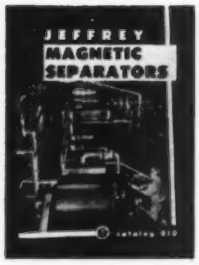
174—Storage Bins

If you specify vertical storage construction for handling flowable bulk materials, this ten-page foldout will help you visualize how this company's Super-Concrete Stave Storage Bins might meet your requirements. The booklet contains photographs of typical installations, lists uses, and explains construction. *The Neff & Fry Co.*



179—Weighing Scales

"W/C Pneumatic Weighing Scale," four-page folder 10, describes a new platform weighing scale adaptable for batch or continuous process control, with scale indication errors never greater than 0.25 percent of range. Bulletin covers outstanding features, typical applications, accessories, capacities, and sizes. *Weighing Components, Inc.*



180—Magnetic Separators

Catalog 910, 16 pages, points out advantages of drum type separators for wet concentration and magnetic recovery. It describes design and applications, showing many different designs in use for iron ore, magnetite concentrate, taconite, and coal. Typical operating results with each material are tabulated. *Jeffrey Mfg. Co.*



182—Overhead Handling

"How Trambeam Cuts Handling Costs," eight-page bulletin M-25, describes advantages and features of overhead handling of materials and products in receiving, storage, production, and shipping. Basic types of Trambeam systems — crane, monorail, and stacker crane — are illustrated with suggested applications. *Whiting Corp.*



181—Bulk Materials Handling

Dravo equipment for handling bulk materials — ore and coal bridges, man trolley unloaders, replacement trolleys, rope operated towers, and hydraulic buffers and rail clamps — are illustrated and described in 32-page bulletin 225. Elevation drawings and features of construction are given for each type. *Dravo Corp.*



183—Storage Tanks

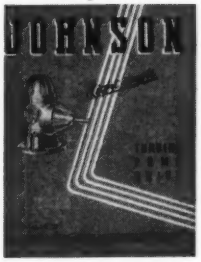
"Graver Standard Storage Tanks," 20-page bulletin, explains petroleum industry applications of storage tanks, their use for acid storage, as grain bins, for concentrated liquid caustic soda, and in asphalt plants. Engineering data are given for the various sizes and types of tanks and for site-erected structures. *Graver Tank & Mfg. Co., Inc.*

MECHANICAL POWER TRANSMISSION



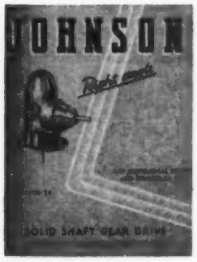
184—Flexible Gear Couplings

Advantages and typical applications of flexible gear couplings are pictured and described in 16-page catalog C-4, "The Revolutionary New Sier-Bath Flexible Gear Couplings." Couplings are available in standard, vertical, mill-motor, floating shaft and spacer type, and in many special purpose types. *Sier-Bath Gear & Pump Co., Inc.*



188—Turbine Pump Drives

Right angle turbine pump drives, in standard and combination drive installations and available in a wide range of models to meet specific requirements of high or slow speed prime movers and pumps, are described and illustrated in nine-page catalog 27. Tables and charts show power ratings and average efficiencies. *Johnson Gear & Mfg. Co.*



185—Right Angle Gear Drives

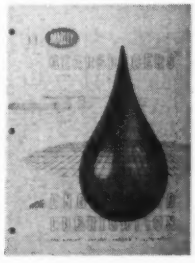
Right angle solid shaft gear drives, for centrifugal pumps and industrial use — cooling tower installations, barge service, sewage disposal, fire and flood control — manufactured in a wide range of models to meet specific requirements, are described and illustrated with engineering details in eight-page catalog 28. *Johnson Gear & Mfg. Co.*

To order personal copies of these bulletins, please fill out the card between pages 2 and 3 or 34 and 35.



186—Clutches

The Electro Clutch, developed to connect or disconnect a driven shaft or gear from a driving shaft that is either running or standing still, is described in four-page bulletin ECP-656. Photos show the units in typical industrial applications where many output speeds are desired. *I-T-E Circuit Breaker Co., Transformer-Rectifier Div.*



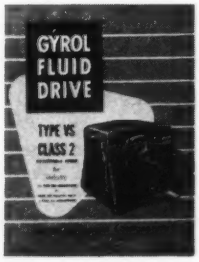
190—Cooling Tower Equipment

Marley Geareducers, cooling tower speed reduction units built to accommodate the greater horsepower requirements of today's larger industrial cooling towers, are described in folder EL-57. Engineered lubrication which consists of a system of recirculating lube oil through a filter is described in detail. *The Marley Co.*



187—Universal Joints

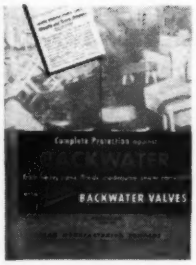
Conseco Bevel Gear Universal Joints are designed to give perfect remote control of inaccessible valves, pumps, engines, antennae, ventilators, and turrets, according to eight-page bulletin CS-10, Construction, materials, capacity (from 1580 to 4938 in. lb. at 49 rpm), and applications are described. *Condenser Service and Engineering Co. Inc.*



191—Fluid Drives

Advantages and applications of adjustable speed Gyrol drives are discussed in eight-page bulletin A-119 which covers Type VS Class 2 Gyrol Fluid Drives in the 7½ through 800 hp range. Installation drawings give basic dimensions for each unit size and various mounting arrangements possible are illustrated. *American Blower Corp.*

PIPING, VALVES, AND PLUMBING



192—Backwater Valves

The complete protection afforded by Josam backwater valves from backwater from heavy rains, floods, and inadequate sewer carry-off is outlined in eight-page manual BW. A table of dimensions is accompanied by detail drawings. Standard and optional features and accessories are described for the various types. *Josam Mfg. Co.*



193—Insulated Piping Systems

"Prefabricated Insulated Piping Systems," new 20-page bulletin 57-1, shows typical uses for Hel-cor pipe units for underground or overhead piping systems, and for Utilidor conduits for protection of underground utility services. Sample specifications are given, along with conduit sizing charts and trenching dimensions. *Ric-wiL, Inc.*



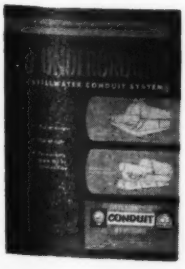
194—Valve Comparison Chart

This 20-page valve comparison chart is designed for your convenience in eliminating change-over problems by listing and describing OIC valves consecutively and cross-indexing these catalog numbers with the numbers of similar types of valves made by other manufacturers in iron, bronze, cast steel, and forged steel. *Ohio Injector Co.*



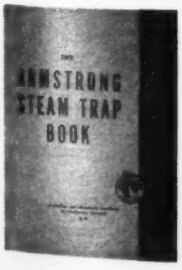
195—Welding Neck Flanges

Bulletin TT821 describes the newly developed Tube-Turn lightweight Taper Face welding neck flange for use in water, oil, and gas service. Designed to join low pressure or lightweight welded piping to 125 lb valves and pumps, it eliminates the danger of overstressing or damage. Specifications are given. *Tube Turns, Inc.*



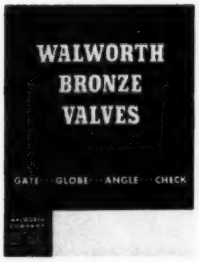
196—Conduit Systems

"Go Underground with Stillwater Conduit Systems," four-page illustrated brochure, describes tunnel and round ceramic conduit systems. It points up advantages of Stillwater Conduit Systems — permanence, protection, adaptability, ease of installation, and efficiency — in service piping. *Stillwater Clay Products Co., Conduit Div.*



197—Steam Trap Manual

"The Armstrong Steam Trap Book, 2nd Edition," 46-page catalog J, explains the benefits of good trapping and how you can obtain them. A handbook section provides capacity charts and other data necessary to the correct trapping of all major classes of steam-heated equipment. Manual is completely indexed. *Armstrong Machine Works.*



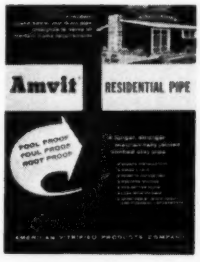
198—Bronze Valves

"Walworth Bronze Valves," 14-page booklet 158, is made up of articles reprinted from the house organ *Walworth Today.* An article is presented on each kind of valve — gate, globe, angle, and check — with accompanying cutaway drawings of available types. Applications and variations from basic types are covered. *Walworth Co.*



199—Bronze Globe Valves

Circular L-956-57 describes the outstanding features of the two pressure classes of Lunkenheimer LQ Bronze Globe Valves, rated at 150 lbs sp, 300 lbs wog, and at 200 lbs sp, 550 F, 400 lbs wog. It describes Brinalloy seats and discs that are more resistant to wear and corrosion than 500 Brinell stainless steel. *Lunkenheimer Co.*



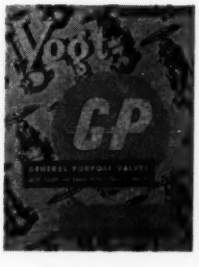
200—Vitrified Clay Pipe

Mechanically jointed vitrified clay pipe that speeds installation, saves labor, permits deflection, absorbs shocks, permits better flow, requires less maintenance, and is approved by state health and plumbing departments for small capacity jobs is described in six-page folder. Factors affecting pipe are discussed. *American Vitrified Products Co.*



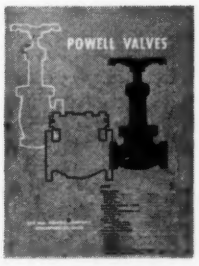
201—Drainage Structures

"AmBridge Sectional Plate — Pipes, Arches, and Pipe-Arches," 28-page catalog AB10567M, presents complete information on these low cost drainage structures. It covers design, sizes, weights, gages, and assembly instructions. It also gives elevation drawings and layout details. *United States Steel Corp., American Bridge Div.*



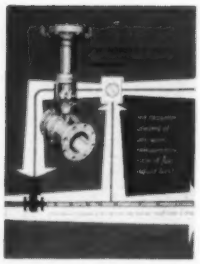
202—General Purpose Valves

New drop forged steel screw and socket weld end valves, in sizes ¼ through 2 in., rated at 800 psi at 850 F and 2000 psi at 100 F, are described in 32-page "General Purpose Valves, Gate, Globe, and Angle Types." Pressure-temperature ratings, specifications, and dimensions are given for each type valve. *Henry Vogt Machine Co.*



203—Valves

This 24-page catalog describes and illustrates Powell bronze, iron, steel, and corrosion resistant valves, and engineering specialties such as liquid level gages, lubricators, cocks, blow gun and air valves, whistles, and whistle valves. Engineering information included makes this a "must" for your library. *The William Powell Co.*



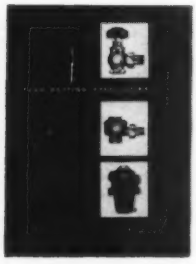
204—Diaphragm Motor Valves

For accurate control of pressure, temperature, rate of flow, and liquid level, four-page bulletin J-170 describes the OPW-Jordan sliding gate diaphragm motor valve. Drawings show location of the valves for back pressure relief, pressure regulation, and for remote control. Capacities and dimensions are listed. *Jordan Corp.*



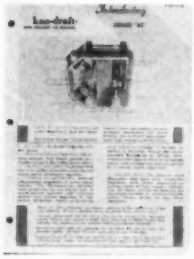
205—Chemical Service Valves

Bulletin V/4b describes Durco Type F valves for chemical service, designed and built to furnish maximum service with minimum maintenance when handling strong corrosive materials. Complete dimensions are provided in drawings and tables for valve sizes ½ through 3 in. in a number of different alloys. *Duriron Co., Inc.*



206—Steam Heating Specialties

Illinois steam heating specialties — packless radiator valves, thermostatic and float traps, vapor systems, and boiler room specialties — are described in eight-page bulletin 201. Cross sections, elevation drawings, specifications, and a description of component parts are included for each item in the line. *Illinois Engineering Co.*



207—Valve Attenuators

Bulletin K-35 contains advanced information on the new Series "45" high pressure valve attenuator. It gives dimensions, specification charts, layout diagrams, sizes, a cutaway drawing of the Kno-Draft air diffuser, and describes construction, advantages, operation, and other data of interest to the consultant. *Connor Engineering Corp.*



208—Eye Wash and Shower Units

Detailed information about Haws emergency eye wash and drench shower facilities with specific reference to school use is in four-page folder 8900. It informs as to operation, specifications, and prices, and indicates how school safety programs benefit from reduction of contamination injuries in labs and shops. *Haws Drinking Faucet Co.*



209—Flow Tubes

The Gentile Flow Tube, now in use for metering water, air, steam, oil, jet fuel, hydrocarbon liquid, clay, slurry, raw sewage, brine, methanol vapors, black liquor, casing head gas, coke oven gas, argon, helium, sludge, white water, and paper stock is described in six-page bulletin FT. Sizes start at 3/8 in. I.P.S. *Foster Engineering Co.*



210—Neoprene Coatings

"Atlas Neoprene Coatings . . . Their Selections and Use," four-page bulletin 7-N, describes in full the complete line of Atlas neoprene coatings, for jobs that involve a simple maintenance procedure to jobs where the most severe corrosive and abrasive service is required. Chart shows resistance to chemicals. *Atlas Mineral Products Co.*



211—Hard Rubber Fittings

Buna-N hard rubber products — their resistance to heat and oil, physical properties, and resistance to various types of chemicals — are described in four-page folder E-212. It gives data on plug cocks, tees, couplings, pipe caps and plugs, unions, straightway cocks, ells, crosses, reducing bushings, and flanges. *Luzerne Rubber Co.*



212—Piping

"Services and Facilities of Power Piping and Sprinkler Division," six-page folder 2542, explains how this division can help you serve your clients in the utilities industry, oil refineries, steel mills, paper mills, and chemicals. Piping flexibility computation services available to consulting engineers are explained. *Blaw-Knox Co.*



213—Float Valves

Golden-Anderson Cushioned Float Valves are described completely in new 16-page bulletin W-5. Parts lists and dimensions are given for each type of float valve, along with other pertinent technical information such as application, installation, and operation. Typical installations are shown. *Golden-Anderson Valve Specialty Co.*



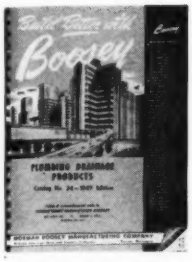
214—Solenoid Valves

Condensed valve catalog 201, 32 pages, covers ASCO solenoid valves. Included are valve selection charts; water, air, and gas flow charts; flow data; sizes, capacities, and dimensions; elevation drawings; steam flow charts; and other pertinent engineering data on a complete line of solenoid valves and strainers. *Automatic Switch Co.*



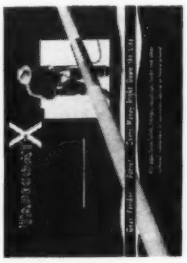
215—Roof Drains

Roof drains and roof drainage accessories for every requirement, for every type of construction, are described in six-page manual RK. A cutaway drawing of each product is accompanied by a list of applicatons. Such features as integral expansion joint, adjustable flooding water dam, and adjustable top are described. *Josam Mfg. Co.*



216—Plumbing Drainage Products

Catalog 34, "Build Better with Boosey," gives specifications, dimensions, suggested applications, drawings, and engineering data on a complete line of plumbing drainage products. It covers back water control valves, grease interceptors, floor and shower drains, roof drains, vacuum breakers and fixed air gaps. *Norman Boosey Mfg. Co.*



217—Pipe Protection Tape

Tapecoat-X, the coal tar coating in tape form for single-wrap application, is described in this four-page bulletin. Illustrations and data point up economies in time, material, and labor resulting from extra thickness of coal tar available for protecting pipe, pipe joints, fittings, couplings, and tanks. *The Tapecoat Co.*



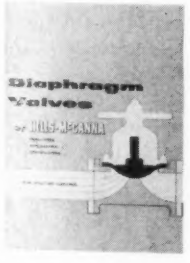
218—Valves

Twenty-page catalog V-55 covers magnetic and motorized valves for air, water, gas, steam, oil, and refrigerants. It includes specifications, sizes, capacities, and suggested applications for each type of valve, flow charts for liquids and compressible fluids, tables of dimensions, and other engineering data. *The Mercoid Corp.*



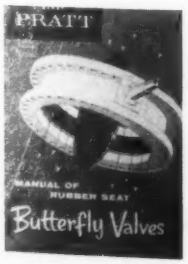
219—Jointed Clay Pipe

Jointed vitrified clay pipe known as Amvit, with a built-in mechanical joint made from polyvinyl chloride is described in four-page folder. Advantages such as infiltration prevention, quick installation, immediate backfilling, better flow, shock absorption, and quick testing in the field are pointed out. *American Vitrified Products Co.*



220—Diaphragm Valves

New 12-page catalog 100 describes Hills-McCanna diaphragm valves in terms of their advantages, applications, and specifications. The three basic types of valve operation are shown in cross sectional views, and dimensional specifications are given. Information is included on plastic bodies and diaphragms. *Hills-McCanna Co.*



221—Valve Manual

Forty-page catalog B-2 is designed to help engineers select valve types, understand their characteristics, and determine space requirements. It includes such useful data as: pressure drop and flow tables, conversion tables, theory and application, recommended materials, and describes Pratt valves and operators. *The Henry Pratt Co.*



222—Solder End Valves

Two-page circular 603 details sizes, dimensions, types, and features of Solder End Globe, Gate, and Check Valves, particularly suited for steam, hot, and cold water lines; heating and air conditioning systems; oil, natural, and manufactured gas lines; underground water lines; and industrial use. *The Lunkenheimer Co.*



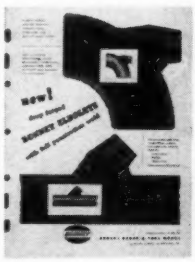
223—Impulse Steam Traps

The new Series 40 Yarway Impulse Steam Trap, designed for use where condensate must be handled in unusually large quantities, is described in four-page bulletin T-1746. It pinpoints applications, and gives full information on capacities, sizes, materials, weights, construction features, and method of operation. *Yarnall-Waring Co.*



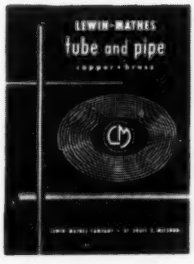
224—Drains

This six-page "Selection Reference Guide" contains brief suggested specifications for use in setting up standard consulting engineers' specifications. It gives complete information on which Boosey drain to select for each location. Data is taken from recent installations in which these products were used. *Norman Boosey Mfg. Co.*



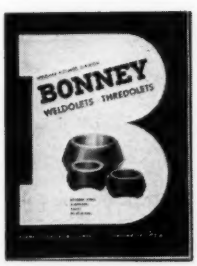
225—Drop Forged Fittings

The new drop forged Bonney Elbolets with full penetration weld are described in this catalog sheet. Applications for directional flow branches, Thermowell connections, and pipe support and hanger connections are discussed. These fittings are available from stock in carbon steel, stainless steel, and chrome moly. *Bonney Forge & Tool Works.*



226—Tubing and Piping

This 12-page bulletin lists each type of Lewin-Mathes copper and brass tubing and piping with the temper, lengths, fittings, uses, and specifications. Sizes and capacities are in table form to aid in selection. Photos show use for water piping, air conditioning, heating, underground service and drainage lines. *Lewin-Mathes Co.*



227—Fittings

This bulletin illustrates when and where to use Weldolets, Thredolets, and Socket Weldolets. Specific areas of application are shown with correct installation procedure. It describes the complete range of stainless, alloy, and nonferrous fittings and Bonney's new marking standard. *Welding Fittings Div., Bonney Forge & Tool Works.*



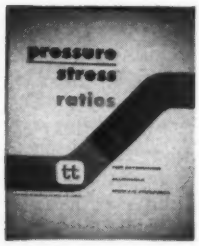
228—Drinking Fountains

Photos, specification drawings, and descriptions of the complete Haws line of drinking facilities and allied products are in this 72-page catalog, including: wall and pedestal models; deck type receptors; recessed models, multiple bubblers, electric water coolers; emergency eye wash; and drench shower units. *Haws Drinking Faucet Co.*



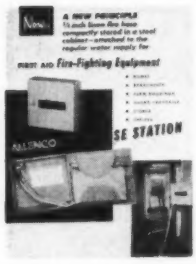
229—Plug Valves

Eight-page bulletin 1003-R explains how the triple seal on OIC iron lubricated plug valves ends shank leaks and holds adjustment, saving maintenance time. It gives elevation drawings, table of general valve dimensions, and service recommendations, functions, and specifications for lubricants. *The Ohio Injector Co.*



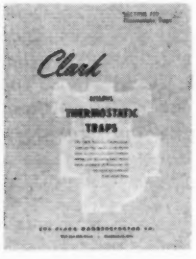
230—Pressure Stress Ratios

Bulletin TT698, "Pressure Stress Ratios," provides quick reference for the pressure-stress ratios used in determining allowable working pressures for any pipe size, wall thickness, and corrosion allowance. The 21 pages contain time-saving charts to relieve you from unnecessary mathematical computations. *Tube Turns, Inc.*



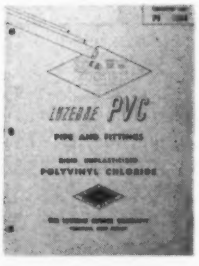
231—Fire Hose Stations

This four-page bulletin presents a new built-in and wall-mounted fire hose station for offices, farm buildings, factories, and other commercial and industrial buildings. It is completely illustrated and includes specifications, suggested locations, and dimensions. A separate price list is included with booklet. *W. D. Allen Mfg. Co.*



232—Thermostatic Traps

Clark Bellows Thermostatic Traps presented in catalog section 710 are of cast semi-steel, cast steel, or cast brass construction with either bronze or monel bellows. Each trap is equipped with an orifice that operates over entire pressure range. Continuous discharge capacities from 5 to 100 F temperature differential. *The Clark Mfg. Co.*



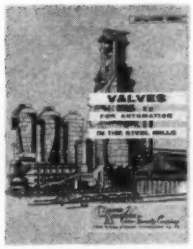
233—PVC Pipe and Fittings

Bulletin PF 1100, eight pages, presents a list of applications for PVC pipe and fittings where corrosion resistance, nontoxicity, and noncontamination are required. Mechanical, electrical, thermal, and miscellaneous properties of both normal impact and high impact PVC products are in table form for easy reference. *The Luzerne Rubber Co.*



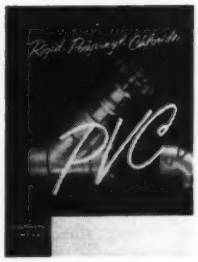
234—Piping Fittings

General catalog 55, 304 pages, presents detailed dimensional data and specifications on a complete line of seamless welding fittings and forged fittings. It includes a 56-page technical data section featuring allowable stress and P/S tables and maximum working pressure charts. Catalog is tab indexed for quick reference. *Ladish Co.*



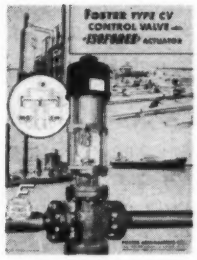
235—Valves for Steel Mills

"Valves for Automation in the Steel Mills," 16 pages, shows diagrammatically in a typical installation each of the G-A valves with a definite, special use in steel mills. Operation of altitude, float, solenoid operated, spray, Flowtrol, surge relief, pressure reducing, and check valves are covered. *Golden-Anderson Valve Specialty Co.*



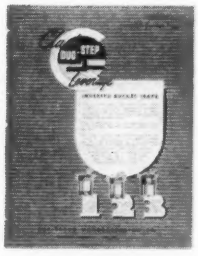
236—PVC Valves

Sixteen-page booklet 160-2 on Walworth rigid polyvinyl chloride valves and fittings gives valuable background information on characteristics of normal and high impact PVC, pointing out its advantages for chemical and petroleum plants. Dimensions, drawings, applications tables, and working pressures are given. *Walworth Co.*



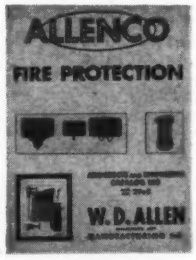
237—Control Valves

The Foster Type CV control valve with Isoforce actuator is illustrated and described in this eight-page bulletin. When to use a controller rather than a regulator is pointed out. Elevation drawings, a cutaway, and specifications are given. Included is a two-page sheet explaining the valve's Isoforce utility actuator. *Foster Engineering Co.*



238—Inverted Bucket Traps

Clark Inverted Bucket Traps equipped with Duo-Step leverage are shown in four-page catalog section 230. Full specifications and details are given and cover a range of operating pressures up to 1000 psig and temperatures to 850 F. Proper steam trap can be selected by referring to tables showing continuous flow capacities. *The Clark Mfg. Co.*



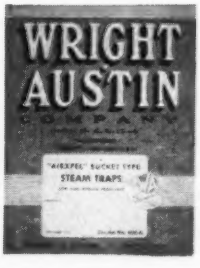
239—Fire Protection Equipment

Catalog 150, 42 pages, covers the complete Allenco line of fire protection equipment: fire hoses, fire hose racks, and reels; fire extinguishers; built-in and wall mounted cabinets for the above equipment; standpipe and wall hydrant connections and nozzles. Installation specifications are given for each item. *W. D. Allen Mfg. Co.*



240—Expansion Joints

A new improved Type W Gun-Pakt Expansion Joint is completely described in eight-page bulletin EJ-1915, which points out that all of the outstanding features of the Yarway Gun-Pakt Joint have been retained and incorporated with a new one-piece body and gland that permits several important advantages. *Yarnall-Waring Co.*



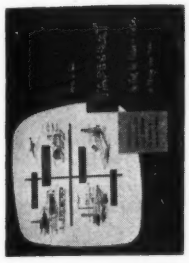
241—Bucket Steam Traps

Airxpel bucket steam traps for low and medium pressures are described and illustrated in four-page bulletin 606-B. Ease of installation, interchangeability of valves and seats, accessibility, water seal, construction, dimensions, and materials are discussed. A capacity-orifice chart for Wright-Austin traps is given. *Wright-Austin Co.*



242—Lagging Adhesives

Swift's lagging adhesives for heating and process piping, and the 12 important advantages that they offer, are described in four-page folder 9283. They are recommended for bonding shells of molded insulation to themselves or pipes; as binder for loose insulation; and to adhere and size lagging cloth. *Swift & Co., Adhesives Products Dept.*



243—Pipe Protection

"Where to Use Tapecoat," eight-page bulletin, presents applications and data on Tapecoat coal tar coating in tape form for double-wrapping on pipe, pipe joints, mechanical couplings, conduit, cable and insulated piping, above and below ground. It includes table of coverage for various sizes and presents case histories. *The Tapecoat Co.*



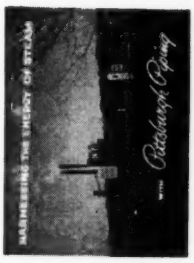
244—Underground Piping

Bulletin SW-1156-55 describes the One-Over-One Cert-A-Bar Conduit System — a new development in underground piping layouts for steam and condensate systems and high temperature water systems. Easier installation, smaller and fewer manholes, and elimination of pipe crowding are discussed. *Stillwater Clay Products Co., Conduit Div.*



245—Pipe Insulation Manual

"Technical Data Manual," 20-page booklet, is designed to give engineers all available information on the application of Gilsulate, a new insulation for hot underground pipes. It describes the three grades, how to determine ditch size for various pipes and types of soil, and gives sample problems. *American Gilsonite Co.*



246—Power and Process Piping

"Harnessing the Energy of Steam" describes research, metallurgy, engineering, fabrication, and erection of high temperature, high pressure ferritic and austenitic alloy piping for central station, industrial, nuclear energy, and processing plants. Quality control and test methods are given. *Pittsburgh Piping and Equipment Co.*



247—Stainless Steel Fittings

This 22-page catalog explains how Speedline stainless steel fittings reduce piping costs by allowing the designer to take advantage of the new and more economical Schedules 5 and 10 stainless steel pipe. A schematic drawing illustrates use of these fittings for a wide range of industrial applications. *Horace T. Potts Co.*

PLANT SITE SELECTION



248—Erie Area Sites

Complete information about this 1700-acre rail-side location, ideally suited for a large industry, is described in this folder. It is 24 miles from downtown Cleveland, 17 miles from Akron, with 5000 ft of Ohio Turnpike frontage. Data on other Erie area sites also available. *Industrial Development Dept., Erie R. R.*



249—New York State Map

"Physical Map of New York State and Adjacent Areas," full color wall map, suitable for framing, 3½ x 2½ ft, gives major highways, single and multiple track railroads, short line rail distances between cities, and other data pertinent to questions your clients will ask about locating in New York State. *New York State Dept. of Commerce.*



250—Pennsylvania Plant Sites

"Pennsylvania Plant Location Services" contains the type of information that your clients in manufacturing, distributing, and real estate need to know about new plant locations in Pennsylvania. It lists the varied services available through the Bureau of Industrial Development. *Commonwealth of Pennsylvania, Dept. of Commerce.*



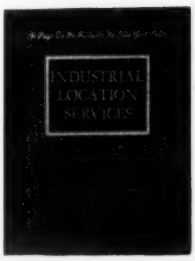
251—New Plant Financing

The Pennsylvania plan of 100 percent financing for a new industrial plant is described in this pamphlet. It tells how financing can be achieved without cash investment by the manufacturer and gives other advantages. It is a companion piece to bulletin No. 250. *Commonwealth of Pennsylvania, Dept. of Commerce.*



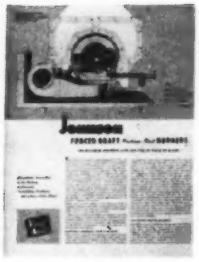
252—Colorado Site Facts

Documented facts about sites, power, labor, raw materials, markets, transportation, climate, taxes, and living conditions are contained in the booklet, "An Analysis of Industrial Colorado and Its Potential for Industrial Development." Booklet is in loose-leaf form so that it can be kept up to date easily. *Colorado Dept. of Development.*



253—Location Services

"Industrial Location Services," eight-page bulletin, is designed to acquaint you with the scope and character of this service offered by the New York State Department of Commerce. It discusses information available on raw materials, transportation, markets, labor, power and fuel, water, and sites. *New York State Dept. of Commerce.*



254—Forced Draft Package Burners

If your client needs a factory assembled burner that can be installed with minimum cost and time, send for four-page bulletin 10M-2-15-57 on the Johnson forced draft package burner. Units that burn oil, gas, or either are pictured with a description of operation and special construction features. *S. T. Johnson Co.*



255—Diesel Engines

Two new engines, compact and lightweight in design, are described in eight-page booklet DE625. The Series G engines, offered either naturally aspirated or with turbocharger, and designed for both industrial and electric set application, with new smaller dimensions for adaptability, are described. *Caterpillar Tractor Co.*



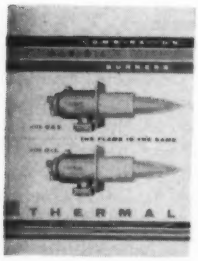
256—Jet Ignition Stoker

A modern smokeless method for burning coal is presented in 20-page bulletin G-85, which covers the B & W Jet Ignition Stoker. Subjects include fuel choice, stoker choice, definition of jet ignition, and typical applications. Cutaways and elevation drawings show the stoker as applied to various boilers. *The Babcock & Wilcox Co.*



257—Electric Plants

How 28 Onan electric generating plants supply power for difficult tower construction job in northern Minnesota is told in Vol. 12, No. 2 of *Power Points Digest*. It also covers use of the units by construction crews, for operation of a portable floodlight tower, and for other power applications in the field. *D. W. Onan & Sons, Inc.*



258—Gas and Oil Burners

Bulletin 109, "Combination Gas-Oil Burners," covers the operating principles and application of high velocity gas or oil burners. Flame characteristics, the bulletin points out, are identical whether gas or oil is used as the fuel. Dimensional data and output curves are given for standard models. *Thermal Research & Engineering Corp.*



259—Spreader Stokers

Spreader stokers said to be adaptable to all types and makes of modern steam boilers and generators, from 5000 to 75,000 lb per hr steam output capacity, are described in 14-page brochure 800. Various installations using Roto-Stoker Type CC stokers of these capacities are highlighted by means of cross-sectional drawings. *Detroit Stoker Co.*



260—Packaged Generators

This catalog covering the full line of Cyclotherm package steam generators gives complete specifications and product data. Representative models are illustrated to point up various features of each. Also included is detailed information on the operation of Cyclonic Combustion. *Cyclotherm Div., National-U.S. Radiator Corp.*



261—Emergency Power

"Emergency Electric Power for Communications," Vol. 12, No. 1 of *Power Points Digest*, tells how various telephone companies, fire departments, and radio stations rely on Onan emergency power in the event of highline power interruption. It gives a brief description of each installation and a photo. *D. W. Onan & Sons, Inc.*



262—Packaged Generators

The Pantex Speedylectric packaged steam generators are described and illustrated in six-page bulletin SG-100. Basic principle of Speedylectric electrode steam generator operation and construction is discussed. Units have built-in balanced control with ratings 2 to 60 bhp, 15 to 475 psig. Specifications are given. *Pantex Mfg. Corp.*



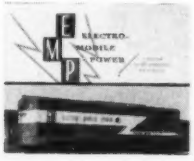
263—Flowrites

Proof in years and numbers that Flowrites prevent tube-end erosion is presented in this eight-page bulletin. Included is the report of tests on Flowrites that were conducted by Massachusetts Institute of Technology, along with graphs of friction with and without nozzles, and power saved. *Condenser Service and Engineering Co., Inc.*



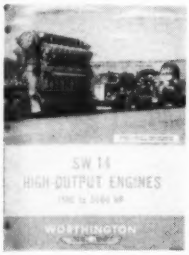
264—Tube Protectors

Condenser tube erosion and its prevention by use of clip-on stainless steel tube protectors are described in four-page bulletin 19B8590. Typical problems solved by use of Allis-Chalmers tubes are discussed. Photographs point out damage caused by erosion and a brief resume is given of the usual causes. *Allis-Chalmers Mfg. Co.*



265—Mobile Generating Stations

Eight-page bulletin 23M57RL describes a 500-kw mobile highway generating station for utilities, providing for disaster protection, planned outage, standby power, service to new demands, local seasonal peaks, and line relocation. Each component of the trailer is described and dimensions are given. *Electro-Motive Div., General Motors Corp.*



266—High Output Engines

High output, turbocharged SW 14 engines, 1500 to 5000 hp, are described in 12-page bulletin S-500-B60A. These engines, designed for use wherever economical continuous power is required, are available as oil diesel, dual fuel diesel spark ignition gas, or tri-power units. Construction features and ratings are given. *Worthington Corp.*



267—Scotch Boilers

Catalog 513 illustrates and describes in detail 16 sizes of Kewanee LM-800 Series low pressure scotch type boilers for low pressure steam or hot water heating. Ratings are 1,313,000 to 21,855,000 Btu. Boiler is designed and rated with 8.2 sq ft of heating surface per boiler horsepower. *Kewanee Boiler Div. of American-Standard.*



268—Boiler Blowoff Equipment

Of special interest in bulletin WC-114 on Graver continuous boiler blowoff heat recovery equipment is a series of curves and charts that allow calculation of the approximate saving realized by use of continuous blowoff. Each type of system is described along with accessories. Flow diagrams are included. *Graver Water Conditioning Co.*



269—Wormfeed Stokers

Modern boiler room layouts and floor plans are provided in eight-page bulletin on the Duraflex Binfeed, a wormfeed stoker for industrial and commercial installations. Side ash dumps, extra grate area, and zoned windbox are a few of the features described. Available auxiliaries and accessories are listed. *Canton Stoker Corp.*



270—Stationary Grate Stoker

The Detroit UniStoker, a plunger feed, stationary grate, side-cleaning stoker available in sizes for 125 to 250 hp boilers, is described in 16-page bulletin 604. Drawings, photos, and cutaways are used to show how the stoker operates, its advantages, and its application to various types of boilers. Each component is described. *Detroit Stoker Co.*



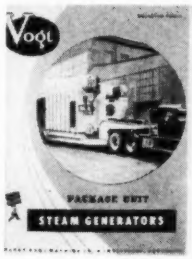
271—Forced Draft Burner

Fundamental difference between an ordinary gun type burner and the Johnson Bankheat forced draft burner is explained in bulletin 10M-2-57. Installation drawings show the burners in operation in warm air, hot water, and steam systems. Sizes and capacities are listed for units burning oil, gas, or a choice of either. *S. T. Johnson Co.*



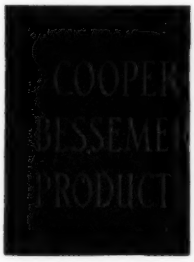
272—Boilers

Complete data and specifications are given for each of the models and sizes in Bros line of "S" series boilers in eight-page bulletin WT-8. Units can be furnished for coal or for gas or oil with capacities from 10,800 to 50,000 lbs of steam per hr. Design features and special construction advantages are covered. *Bros, Inc.*



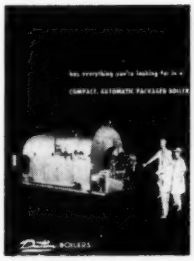
273—Package Steam Generators

Bulletin PSG-2, 10 pages, presents design and construction details, tables of capacities, dimensions, and weights of package unit type steam generators. Available in three standard pressures of 175, 250, and 375 psig, the boilers are designed to be used with many different types of firing and control equipment. *Henry Vogt Machine Co.*



274—Power Equipment

The complete line of equipment produced by Cooper-Bessemer (compressors, pumps, engines) is detailed in eight-page bulletin. Features of each of the many products are summarized as to design and construction. Horsepowers, pressures, capacities, and other pertinent data are given with applications. *The Cooper-Bessemer Corp.*



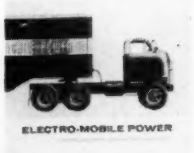
275—Automatic Packaged Boilers

The Dutton EconoTherm boiler has everything you're looking for in a compact, automatic packaged boiler, according to four-page bulletin EC-1056. In sizes through 500 hp, the units feature modern welded boiler shell, rotary combustion, and a choice of forced draft or induced draft fans. *Dutton Boilers, Div. of Hapman-Dutton Co.*



276—Forced Draft Gas Burners

General description, features, standard operation, special models available, specifications, and a photo of a typical installation of the Webster Models C and CJ Dynetic forced draft gas burners are given in bulletin B14. Special models available are listed. Burners have ratings from 800,000 to 3,200,000 Btu per hr. *Webster Engineering Co.*



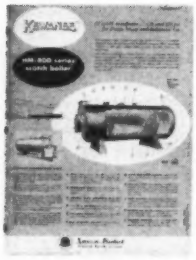
277—Mobile Power

Eight-page bulletin 26M57SS covers Electro Mobile Power, a new tool in a-c generation for utilities. It explains how best to provide for the short time peak, gives operating costs, and lists features of the EMP source. Specifications and an elevation drawing are given. *Electro-Motive Div., General Motors Corp.*



278—Dual Fuel Burners

The Webster Cyclonetic dual fuel burner is illustrated and described in four-page bulletin B11. The burner is designed to operate on either gas or light oil, with fully automatic operation on both fuels. Dimensional drawings, a chart of dimensions, capacities, and specifications are given for each size. *Webster Engineering Co.*



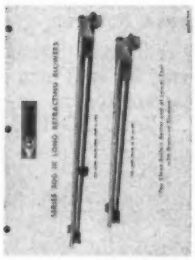
279—High Pressure Boilers

Catalog 512 gives the latest description, illustrations, specifications, and data on Kewanee HM-800 Series high pressure Scotch type boilers. It also includes information on the three new larger sizes of the HM-800. Units now are available with 52 to 651 hp, 125 to 150 psi, for industrial use. *Kewanee Boiler Div. of American-Standard.*



280—Packaged Boilers

These two bulletins cover Series E and F Continental automatic boilers with ratings of 20 to 80 hp, with on-off control and modulating control. Units use No. 2, 5, and 6 oil or gas or can be furnished to burn either. Bulletins give specifications, dimensions, capacities, types, and illustrations of various sizes. *Boiler Engineering & Supply Co., Inc.*



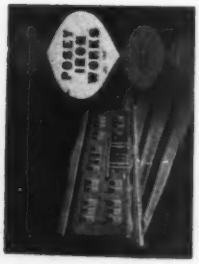
281—Blowers

"You Clean Boilers Better and at Lower Cost with Diamond Blowers," 14-page bulletin 2111, details construction features of the Series 300 IK Long Retracting Blowers. It describes the stationary gear motor drive, motor and control terminal facilities, valves, nozzles, carriage drive, and accessories. *Diamond Power Specialty Corp.*



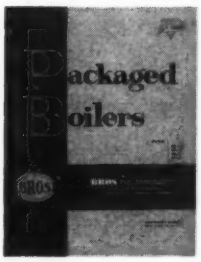
282—Rotary Burners

The new Todd Series B Rotary Fuel Oil Burners are summarized in four-page bulletin TD56-82X. It includes a burner size selector chart and lists 11 advanced design features of seven basic sizes rated from 400,000 to 22,500,000 Btu per hr, with oil capacity from 3 to 150 gal per hr. *Products Div., Todd Shipyards Corp.*



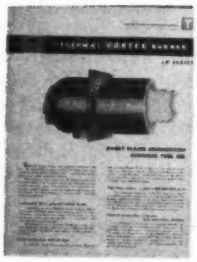
283—Boiler Company Background

This 16-page booklet was designed to acquaint you with the Posey Iron Works Co. — its six divisions, Steel Plate, Brick Machinery, Iroquois, Foundry, Industrial Heating, and Steel Form — and the manufacturing advantages provided by their extensive facilities. Typical products of each are pictured. *Posey Iron Works, Inc.*



284—Packaged Boilers

Eight-page booklet WT-10 contains photos and drawings, and discusses performance features of Bros packaged boilers, ranging in capacity from 8500 to 50,000 lbs of steam per hr. Units are designed for fully or semi-automatic controls, and can be furnished for oil, gas, or for firing of either oil or gas. *Bros, Inc.*



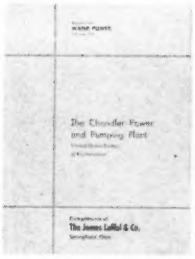
285—Heavy Fuel Burners

Bulletin 111 describes the Thermal Vortex Burner, a complete combustion unit particularly adapted for burning heavy fuels. Burners consist of an air plenum chamber, swirl vane assembly, burner barrel, and integral combustion chamber. A cutaway drawing, dimension data, and output data are given. *Thermal Research & Engineering Corp.*



286—Modern Coal Installations

"More and More Firms are Burning Coal the Modern Way," 20-page brochure, covers case histories of coal burning installations in new construction and in older plants that have been modernized. Data sheet is given for each installation, listing the equipment, location, and the consulting engineer. *Bituminous Coal Institute.*



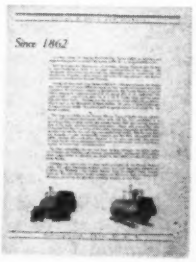
287—Hydraulic Turbines

Details on the Leffel turbines that drive both power generation and pumping units at the United States Bureau of Reclamation Chandler Power and Pumping Plant in the state of Washington are given in 12-page bulletin 1098-E. Descriptive literature on other recent Leffel turbine installations will be enclosed. *The James Leffel & Co.*



288—Atomizing Burners

The Todd Vee-Cee Type Variable Capacity Mechanical Atomizing Fuel Oil Burner for installations with widely fluctuating loads is fully described in four-page bulletin TD56-16X. Bulletin shows special construction that gives uniform, easily oxidized spray, constant pressure, and quick cold starting. *Products Div., Todd Shipyards Corp.*



289—Boilers and Stokers

Complete descriptive and specification information on rugged Scotch boilers for gas, oil, and coal firing, and automatic underfeed stokers for Scotch type boilers, is given in 28-page bulletin 236. This well illustrated brochure includes test results, performance data, and complete details of design and construction. *The James Leffel & Co.*



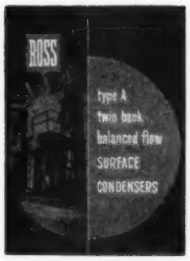
290—Water Tube Generators

Water tube Type D Superior steam generators with capacities up to 50,000 lb steam per hour are described in eight-page bulletin. With the literature comes a 12-page folder of specifications prepared to aid consulting engineers in selection, evaluation, and specification of water tube packaged units. *Superior Combustion Industries, Inc.*



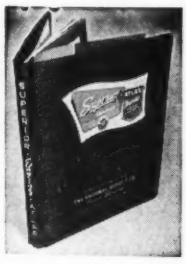
291—Convertible Package Boilers

Water tube package units that can be converted to coal firing during periods of oil or gas fuel shortages are described and illustrated in eight-page bulletin 600. Design and construction features, burner equipment for various fuels, standard and optional panel board equipment, and tests are discussed. *International Boiler Works Co.*



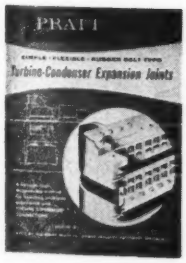
292—Surface Condensers

Twin Bank Balanced Flow design surface condensers — complete description, design details, exclusive features, and numerous photos of public utility and industrial power plant installations — are presented in 32-page bulletin 8.2K1. Details of Single Bank Balanced Flow design are in bulletin 8.1K1. *Ross Heat Exchanger Div. of American-Standard.*



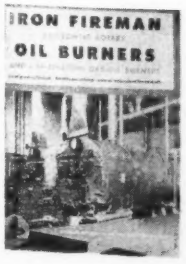
293—Diesel and Dual-Fuel Engines

A complete catalog containing 60 pages describes diesel and dual-fuel engines (including sewage gas engines) ranging from 100 to 2150 hp. Engines are available with speeds to suit a wide range of fixed or skid-mounted engine applications. Cross sections and graphs give engineering data. *White Diesel Engine Div., The White Motor Co.*



294—Condenser Expansion Joints

Discussion of expansion problems of turbine exhausts with special reference to modern, large or twin condensers is presented in this four-page bulletin. It shows construction of the Henry Pratt Rubber Belt Expansion Joint, and details advantages, such as simplified engineering of piping and temperature tolerance. *The Henry Pratt Co.*



295—Oil and Oil-Gas Burners

A variety of oil and combination gas-oil burners are included in illustrated 24-page bulletin 5629. It describes rotary oil burners, firing units with integral air registers, complete package units with factory control panels. The Oil Volumeter that provides steady, uniform oil flow with any grade of oil is shown. *Iron Fireman Manufacturing Co.*



296—Packaged Boilers

Bulletin BA-256, four pages, presents in table form complete design specifications for Continental automatic boilers with 100 to 500 hp ratings with modulating control. The bulletin illustrates and describes advantages and features of the design. Boilers fire No. 2, 5, and 6 oil and/or gas. Specifications given. *Boiler Engineering & Supply Co., Inc.*



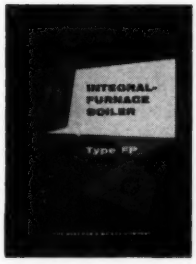
297—Diesel and Dual Fuel Engines

This complete file, on industrial diesel and dual fuel engines of 215 to 1025 hp range, continuous service, describes White Diesel Engine Division's heavy duty units for generating sets, large power shovels, sewage plants, compressor drives, pipelines, dredge pumps and similar services. *White Diesel Engine Div., White Motor Co.*



298—Electric Plants

Catalog KEP56-1, 24 pages, shows the line of Kohler electric plants used as an independent source of electricity for sole supply and for automatic standby when central station power fails. Sizes range from 500 w to 50 kw, gasoline and diesel. Battery charging units in 6, 12, 36, and 140 v capacity are described. *Kohler Co.*



299—Integral-Furnace Boiler

Sixteen page bulletin G-83 describes the B&W Integral-Furnace Boiler, Type FP—a self-contained unit designed for power, process, or heating loads requiring steam capacities in the range of 30,000 to 80,000 lb per hr. The boiler is available for pressures between 160 and 800 psi in standard increments. *The Babcock & Wilcox Co.*



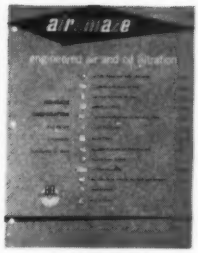
300—VP Package Boilers

Catalog P391, 16 pages, describes the new Type VP package boiler. Following a section of background information is an outline of principal design features. These boilers are shop assembled and provide steam capacities from 4000 to 42,000 lb per hr. Space requirements and specifications are in table form. *Combustion Engineering, Inc.*



301—Packaged Boilers

How Superior's four-pass boiler design lowers steam costs is explained in 20-page booklet. Rotary burner, gas burner, controls, and built-in induced draft feature are each described. Cutaway drawing shows path of combustion gases through the four passes. Data and dimensions are presented in table form. *Superior Combustion Industries, Inc.*



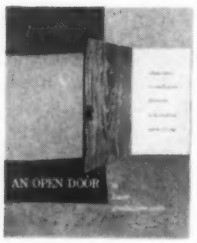
302—Air and Oil Filters

Bulletin ACL 157 gives design and performance data on the complete line of air and oil filters. Panel, oil-bath, oil-wetted, and dry type filters; low and high pressure oil and fuel filters; air intake silencers, spark and flame arresters; breather and air line filters are included with cutaway illustrations. *Air-Maze Corp.*



303—Tanks and Process Equipment

Storage tanks and process equipment are described and illustrated in this four-page folder. It covers floating roof and expansion roof tanks, the Gravesphere, and Vapor-Mixer; gas and chemical scrubber towers, autoclaves, stills, sterilizers, clarifiers, kettles, water treating equipment, and pressure vessels. *Graver Tank & Mfg. Co., Inc.*



304—Processing Equipment

"An Open Door to Lower Production Costs" is a 12-page guide to evaporation, crystallization, filtration, pulp washing, and spray drying equipment available from Swenson for the process industries. It discusses problems in each field and illustrates typical applications in various industries. *Swenson Evaporator Co., Div. of Whiting Corp.*



305—Proportioning Equipment

This twelve-page bulletin includes typical installation diagrams and complete details of multi-liquid proportioning and blending systems for liquid production processing. Simplicity and compactness of the Xacto Blending System is explained and illustrated with flow diagrams. Typical wiring diagrams also are given. *Bowser, Inc.*



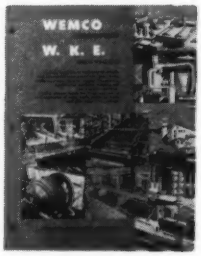
306—Shredders, Grinders, Mashers

Complete engineering data, cross sections, tables, and installation views covering shredders, grinders, and mashers for reducing cork, pulp laps, wood chunks, rubber, citrus fruits, animal waste, bones, and similar types of products are given in 16-page catalog 907. Typical installations are pictured also. *Jeffrey Mfg. Co.*



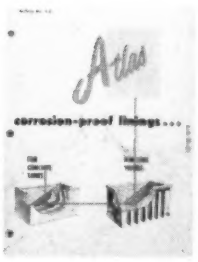
307—Wood Tanks

Wendnagel Tite wood tanks, tubs, and sinks for all types of industries are described in four-page bulletin 23. Suggested uses will give you an idea of how these products fit in with your clients' needs. Examples shown include tanks for sprinkler systems, processing, general water supply, and metal pickling. *Wendnagel & Co., Inc.*



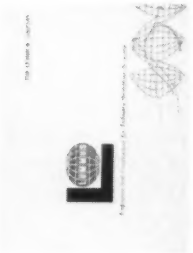
308—Processing Equipment

"Wemco Equipment—W.K.E. Services," four-page catalog G2-B17, deals with equipment for flotation, heavy media separation, gravity concentration, pumping, pulp conditioning, classification, and thickening. It gives general specifications, photos, and recommended uses for each of the various types of units. *Western Machinery Co.*



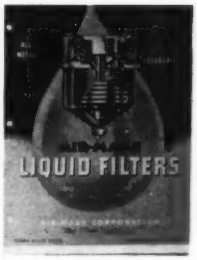
309—Corrosion-Proof Linings

Four-page bulletin 4-2 describes corrosion-proof tank linings available in a variety of materials capable of solving most corrosion problems. A resistance chart lists various chemicals and the types of linings to be used in each instance. Use on concrete and steel vessels of all sizes and types is discussed. *Atlas Mineral Products Co.*



310—Process Plant Construction

This 20-page brochure covers the facilities of The Lummus Co. throughout the world for construction of process plants and refineries, and for production of oil heaters and heat transfer equipment. It describes the work of the Engineering Development Center; offices all over the world; and manufacturing divisions. *The Lummus Co.*



311—Liquid Filters

Bulletin LFC-556, 16 pages, explains important factors in filtering oil, fuel, and hydraulic fluids. It gives useful information on selecting proper filter size, special design considerations, and gives complete technical data on Air-Maze full flow liquid filters — including models to solve special industrial problems. *Air-Maze Corp.*



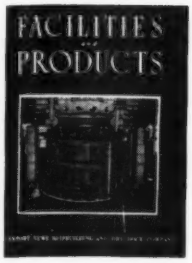
312—Spray Dehumidifiers

The Marlo coil type spray dehumidifier bulletin 3754, eight pages, covers equipment for washing, cleaning, humidifying, dehumidifying, heating, and cooling applications. It gives photos, construction and operational features, cutaway diagram, dimensional data, arrangement charts, and description of components. *Marlo Coil Co.*



313—Heat Transfer Costs

"How to Cut Heat Transfer Costs," bulletin IP-356, features a detailed description of Tranter Platecoil construction, including specifications and dimensions. It lists and illustrates ten major advantages claimed for Platecoil and detailed sketches show 14 ways it has solved industrial heating problems. *Platecoil Div., Tranter Mfg., Inc.*



314—Production Facilities

"Facilities & Products," 92 pages, is a presentation of a portion of the facilities acquired by Newport News during 68 years of continuous operation, together with some of their industrial products, such as paper and pulp machinery, castings and forgings, pipelines, turbines, and compressors. *Newport News Shipbuilding & Dry Dock Co.*



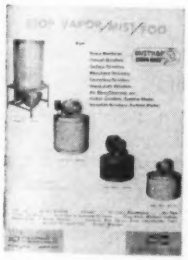
315—Tanks and Chests

Kalamazoo vitrified glazed tile tanks and chests are described in four-page bulletin 1 55-T. Drawings and photos show how the two types of tile blocks available provide flexibility of wall design. Types, sizes, design, erection, and cost are discussed, and typical installations in industry are pictured also. *Kalamazoo Tank and Silo Co.*



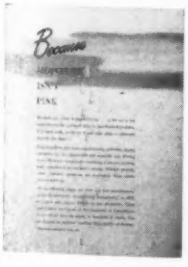
316—Mixers

"Simpson Mix-Mullers for the Ceramic Industry," four-page bulletin, outlines how this unit is used in the preparation of electronic porcelain, tile, structural clay and brick, refractories, whiteware, artware, dinnerware, and other ceramic bodies. Capacities, dimensions, and specifications on various models are listed. *National Engineering Co.*



317—Vapor Collectors

Vapor, mist, and fog control bulletin 622-3 illustrates the complete line of Aget Miskop Vapor Collectors and gives specifications on each model. Applications throughout industry are described in detail and illustrated. Ways in which Miskops can improve production and cut down product rejects are shown. *Aget Mfg. Co.*



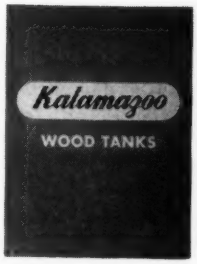
318—Humidity Control

Bulletin 222 is a 32-page manual covering many examples of increased operating efficiency due to humidity control. Equipment illustrated includes air conditioning type Lectrodryers for maintaining lower humidities in rooms, high and low pressure air and gas dryers, breathers for storage tanks, and filters. *Pittsburgh Lectrodryer Corp.*



319—Metal Finishing Wastes

"Practical Methods for Treatment of Metal Finishing Wastes," 12-page reprint by J. C. Hesler, covers a general discussion of plating waste problems and their solutions and then goes on to describe in some detail case histories with the methods used to solve the particular types of problems. *Industrial Filter & Pump Mfg. Co.*



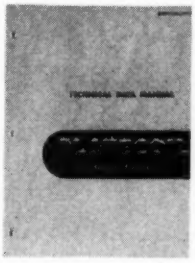
320—Wood Tanks

Eight-page bulletin 655-W explains why wood tanks can meet conditions other types of tanks cannot. It describes round, rectangular, and special tanks, vats, boxes, sinks, and flumes and lists possible uses for each along with the type of hardware and lining available, and gives installation photos. *Kalamazoo Tank and Silo Co.*



321—Chemical Processing Tanks

Typical Wendnagel wood tanks manufactured for use in chemical processing are shown in this two-page bulletin. Resistance to decay, acids, and chemicals, and superior insulating properties are pointed out. Types for fire protection, water storage, wine storage, and scrubbing towers are illustrated. *Wendnagel & Co., Inc.*



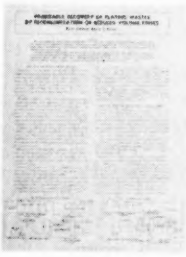
322—Heat Transfer Manual

Technical Data Manual 514-C contains technical and engineering information concerning Tranter Platecoil heat transfer capacities and characteristics. Informative charts and tables based on research, experimentation, and field experience provide valuable short cuts in selection of heating and cooling systems. *Platecoil Div., Tranter Mfg., Inc.*



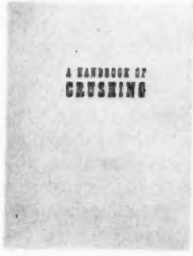
323—Compressed Air Drying

Four-page bulletin 223B covers the Lectrodryer equipment designed especially for handling compressed air, with particular reference to instrument air applications. It provides data on need for instrument air drying, moisture content of compressed air, and proper dewpoint and relative humidity. *Pittsburgh Lectrodryer Corp.*



324—Plating Wastes Recovery

"Profitable Recovery of Plating Wastes by Reconcentration of Reduced Volume Rinses," four-page reprint of an article by K. Odland and J. C. Hesler, gives a review of past procedures, covers ion exchange recovery procedures, and recovery by evaporation. Cost comparison charts and drawings also are included. *Industrial Filter & Pump Mfg. Co.*



325—Handbook of Crushing

"Handbook of Crushing," 40-page booklet, presents a wealth of data for any engineer faced with the problem of selecting the proper crusher for a certain job, or with analysis of a present installation. It gives details of selection, capacities, arrangements, types, and sizes. *Pennsylvania Crusher Div. of Bath Iron Works Corp.*

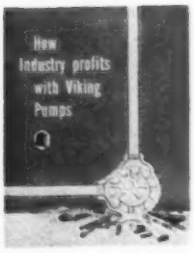


326—Crushing Resistance

"Measuring the Crushing Resistance of Rocks and Ores," 12-page booklet written by Benjamin B. Burbank, noted metallurgist, presents methods and equipment for measuring crushing resistance and abrasiveness of rocks, minerals, and ores. Detail sketches of testers are included. *Pennsylvania Crusher Div. of Bath Iron Works Corp.*

To order personal copies of these bulletins, please fill out the card between pages 2 and 3 or 34 and 35.

PUMPS & COMPRESSORS



327—Pumps

"How Industry Profits with Viking Pumps," eight-page folder 409, illustrates and describes applications for handling petroleum products, LP-gas, chemicals, dry cleaning solvents, diesel fuel, milk, various types of foods, and road building materials. Pumps are available with capacities of from 2/3 to 1050 gpm. *Viking Pump Co.*



328—Submersible Pumps

Sumo deep well submersible pumps, that operate inside the well completely submerged in water, need no pump house, are unaffected by freezing weather and floods, and are safe from tampering, are described in bulletin B-254A. It details construction features and gives selection data on 4 and 6 in. pumps. *Sumo Pumps, Inc.*



329—Heavy Duty Pumps

Four-page bulletin 256D describes the type "L" double suction split case centrifugal pump for heavy duty pumping. Construction is discussed in detail and principal dimensions and cutaway drawings are shown along with installation photographs of the pumps used for low, medium, and high head service. *Weinman Pump Mfg. Co.*



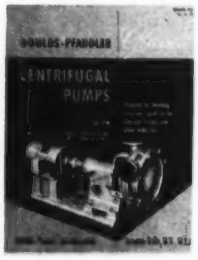
330—Automatic Feed Pumps

"Automatic Feed Pumps and Receivers," four-page bulletin WS95, gives a capacity table and complete specifications for simplex and duplex units designed to drain heating systems or other apparatus in which large quantities of steam are condensed. Operation is described. *Wagener Pump Div., Canton Stoker Corp.*



331—Solids Pumps

The Wemco Torque-Flow Solids Pump, a new concept in materials handling, is described in four-page bulletin P10-B6. It covers pumping operation that permits handling of solids without clogging, and the completely open chamber and recessed impeller. Areas of service are described, along with specifications and operating data. *Western Machinery Co.*



332—Glassed Pumps

The new glassed centrifugal pump that resists chemical attack from corrosive liquids — the result of over three years of mutual research and development by Goulds and The Pfaudler Co. — is illustrated and described in bulletin 725-2. The pumps are built in four sizes for capacities up to 700 gpm. *Goulds Pumps Inc.*



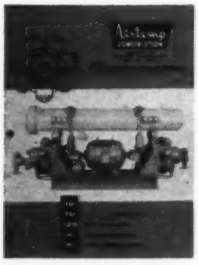
333—Air Compressors

Data sheet 653R lists construction details, specifications, and models of air compressors in the ½ through 20 hp range. It provides engineering data useful in selection of the right compressor for a specific job in almost any type of industry. Suggested applications and drawings are included for each unit. *Brunner Mfg. Co.*



334—Priming Inductors

This four-page bulletin describes Nagle Priming Inductors for use with Nagle centrifugal pumps or pumps that are not self priming made by other manufacturers. The inductors fit on the entrance pipe of the pumping unit. Engineering data on priming and graphs and typical application photographs are included. *Nagle Pumps, Inc.*



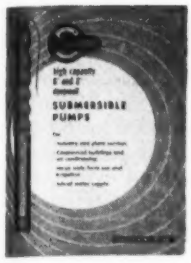
335—Radial Compressors

Radial compressors in the 10 to 125 hp range for commercial and industrial air conditioning and refrigeration are detailed in 38-page bulletin. Pressure lubrication cycle and gas flow are described by means of cutaway drawings. Roughing-in dimensional drawings and condenser data tables are given. *Airtemp Div., Chrysler Corp.*



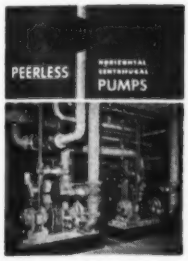
336—Double Suction Pumps

De Laval single stage double suction Types T, U, and W centrifugal pumps for handling large volumes of water are described in six-page folder 1005. Advantages of each construction feature are detailed and a cutaway drawing given. Double volute pumps for heads of 250 feet and higher are described briefly. *De Laval Steam Turbine Co.*



337—Submersible Pumps

Bulletin B-1000 describes Sumo's 6 and 8 in. deep well submersible water supply pumps, widely used for plants, schools, commercial buildings, and all types of services such as water supply, air conditioning, processing, and fire protection. Pump and motor are coupled together as a complete unit and operate under water. *Sumo Pumps, Inc.*



338—Centrifugal Pumps

Peerless Type A Horizontal Centrifugal Pumps for all purpose pumping are described in 16-page bulletin B-1300. General characteristics, construction features, dimension tables, parts lists, and sectional views are given for double suction (1½ through 48 in.) and bottom suction (12 through 42 in.). *Peerless Pump Division.*



339—Rotary Gear Pumps

Eight-page bulletin G-2 gives construction, dimensions, capacities, and applications of Gearex Rotary Pumps: internal bearing type for lubricating materials; external bearing type for non-lubricating. Capacities are 1 to 550 gpm; pressures 250 psi for viscous liquids, 50 psi for water; viscosities 32 to 500,000 SSU. *Sier-Bath Gear & Pump Co., Inc.*



340—Proportioning Pumps

Eight-page bulletin 602, featuring Hills-McCanna metering and proportioning pumps, covers details and specifications of the Model U and K mechanical and hydraulic drive pumps, the Hills-McCannameter for precision pumping as low as 11 cc/min, and the new Model 4411 chemical pump for small capacity systems. *Hills-McCanna Co.*



341—Industrial Service Pumps

Vertical industrial service pumps for transfer and process service, for extra heavy duty, special duty, and heavy duty are detailed in 16-page bulletin B-505. Factors of good and bad sump design are diagrammed and a bibliography given. Photographs of these pumps in use for typical types of service are included. *Peerless Pump Division.*



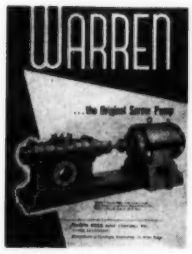
342—Non-Clogging Sump Pumps

Bulletin 500NC, four pages, gives pertinent information and details on Non-Clogging types of sump pumps, designed and built for superior performance in handling liquids of varying viscosity, containing foreign matter. Bulletin 500 SP is available on sump pumps for handling liquids with non-fibrous solids. *Weinman Pump Mfg. Co.*



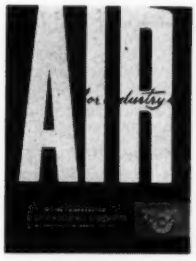
343—Double Suction Pumps

Performance data, dimensions, and specifications on the De Laval single-stage double-suction Types L, M, and P centrifugal pumps, with capacities of 1000 to 20,000 gpm and heads to 350 ft, are presented in six-page bulletin 1004. Features, construction, dimensions, and advantages are described. *De Laval Steam Turbine Co.*



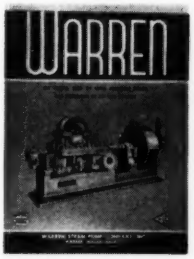
344—Screw Pumps

Twelve-page bulletin WQ-S205 contains sectional drawings, diagrams, charts, and specifications for Warren screw pumps of three designs: standard gear-in-head; high pressure, long body; and vertical. Data is given for pumps with capacities of 1 to 3000 gpm, with detailed information on high pressure applications. *Warren Pumps, Inc.*



345—Air Compressors

Booklet M-81, "Air for Industry," 44 pages, presents M-Line Industrial Air Compressors engineered to meet specific requirements, and to handle those requirements with efficiency at the lowest cost. Combining rugged strength with natural force balance, M-Line units are said to offer superior design. *Cooper-Bessemer Corp.*



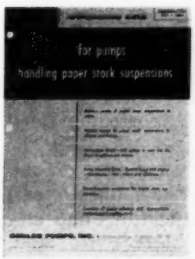
346—High Pressure Pumps

Six stage, high pressure pumps of the centrifugal type are described in six-page bulletin 244. Illustrations show construction, parts, specifications, and special features for pumps with pressure range up to 1200 psi. Bulletin recommends use of these pumps for boiler feedwater, in pipelines, and for mine drainage. *Warren Pumps, Inc.*



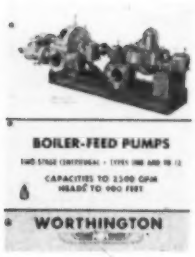
347—Pump Selection Guide

Four-page condensed catalog "Nagle Pump Selector" gives briefing on various types of Nagle centrifugal pumps, all of which are for abusive service in chemical plants, mines, mills, power plants, and heavy industry. Elevation drawings and cutaways are used to point out operation and construction of each of the types. *Nagle Pumps, Inc.*



348—Paper Mill Pumps

Application data bulletin 780-4 shows friction of paper stock in pipes of 3 to 20 inches in diameter and gives charts for elbows and fittings. Pump selection methods note factors of suction, head, stock consistencies, entrained air, excessive throttling, and other factors faced by the consultant. *Goulds Pumps, Inc.*



349—Boiler Feed Pumps

Two-stage centrifugal pumps for boiler feed service are described in four-page bulletin W-318-B23. Pumps are designed for industrial and institutional power plant service in connection with 250-lb boilers. Bulletin shows construction features and gives ratings and dimensions for seven sizes of pumps. *Worthington Corp.*



350—Water Needs

"Your 1100 Gallons . . . " is material taken from address by Robert H. Morse, Jr., president of Fairbanks, Morse & Co., dealing with the quantity of water used daily in the United States and the part that will be played by the pump manufacturer and the consulting engineer in keeping up with demand. *Fairbanks, Morse & Co.*



351—Rotary Compressors

Inherent advantages of rotary compressors for such applications as shop air, drilling, and gas handling are described in four-page bulletin 16B8244. Construction and operational details, dimensions, and ratings of two-stage, sliding vane compressors for 250 to 1800 cfm at pressures from 60 to 125 psig are featured. *Allis-Chalmers Mfg. Co.*



352—Submersible Pumps

This 68-page portfolio—especially compiled for the consulting engineer—contains a series of engineering fact sheets on the submersible pump, complete with drawings, charts, and performance curves. It includes information on selection, applications, special benefits of design, and trouble shooting. *Byron Jackson Pumps, Inc.*

SOUND SYSTEMS



353—Hospital Signaling

Hospital signaling systems, audio and visual and audible, are featured in this 12-page bulletin. Typical wiring diagrams are given for each type of system with specifications. The Soft Speaking nurses' call system, a combination audio and visual type, is described. Emergency alarms are discussed. *Edwards Company, Inc.*



354—Power Plant Sound

Illustrated 16-page booklet p-831, "Power Plant Communications Systems," describes the functions, operation, and specific advantages of central sound systems in power plants. Photos and drawings show how the communciations system is used in a powerhouse. Recommended equipment is described. *Radio Corporation of America.*



355—School Sound Systems

Eight-page brochure 7135-D-55 illustrates and describes a complete line of Underwriters' listed school sound distribution systems. It covers equipment suitable for the smallest to the largest school units. Building-block flexibility of console styles, panels, and functions is pointed out. High power intercoms are covered. *DuKane Corp.*



356—Hospital Signaling Systems

"Hospital Signaling Systems," new catalog section H, 40 pages, presents complete and detailed information on nurses' call systems, staff registers, doctors' paging systems, and other signaling equipment. It includes data on the new Vokalcall audio-visual nurses' call system and gives specifications and engineering data. *Auth Electric Co., Inc.*



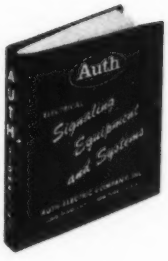
357—Sound Systems

Four-page bulletin 12k/Du illustrates and describes sound, alarm, and evacuation systems in use in some of the largest companies in the country. It outlines operation and functions of various types of systems designed to meet specific requirements, and emphasizes use of standard panels for custom systems. *DuKane Corp.*



358—Fire Alarm Systems

Fire alarm systems for schools, institutions, commercial and industrial buildings are described in this 12-page booklet. The principal types of systems, closed and open circuit, supervised and unsupervised, and coded and non-coded, are presented with applications, drawings, and recommended alarm signals. *Edwards Company, Inc.*



359—Signaling Equipment

This completely revised 130-page catalog gives specifications, wiring diagrams, dimension tables, descriptions, illustrations, and other important functional data on electrical signaling equipment and systems. It covers audible signals, annunciators, hospital systems, clock and program systems, and intercoms. *Auth Electric Co., Inc.*



360—Industrial Sound Systems

"How RCA Sound in Industry Gets Things Done," 12-page booklet 3R2478, details applications for central sound reinforcing, public address, and music distribution systems in industrial plants. It illustrates typical equipment locations and highlights numerous advantages of installing central sound systems. *Radio Corporation of America.*



361—Floor Hardeners

Horn floor hardeners for new construction — how they differ and what each one does best — are described in folder D-15134. Four types are covered: Hornolith, for chemical hardening; Durafax, for abrasive resistance; Ferro-Fax, for impact resistance; and Ferem, for diamond-hard wearability. *A. C. Horn Co., Inc., Sun Chemical Corp.*



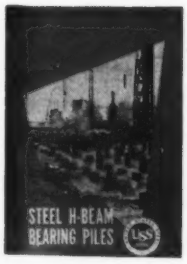
362—Gratings and Treads

Electroforged and other types of gratings and treads are discussed in 26-page bulletin 2527. It includes drawings of the types and spacings in which Blaw-Knox grating is available and shows adaptation to steel plants, sidewalks, locks and dams, and power plants. Safe load tables and specifications are given. *Blaw-Knox Co.*



363—Federal Highway Aid

"The Road Ahead," 24-page booklet D-705, explains the provisions, terms, and requirements of the new Federal Aid Highway Program. A map shows the approximate location of 41,000 miles of two, four, six, and eight lane highways that will make up the interstate system. Financing is discussed. *Caterpillar Tractor Co.*



364—H-Beam Bearing Piles

"Steel H-Beam Bearing Piles," 100 pages, contains general and technical data on characteristics, designing, installation, and corrosion protection of "CBP" bearing piles. Test data on bearing values, sustaining values, soil condition, and bearing capacity are presented, along with a short history of piling. *United States Steel Corp.*



365—Designing With Steel

No. 10 in the series of Weldesign sheets giving detailed information on the application of welding to machine design, the "Elements of Weldesign" studies consider such design problems as materials, strength, and deflection, shaping, appearance, and costs. This sheet deals with cutting costs by proper design in steel. *Lincoln Electric Co.*



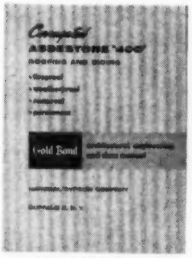
366—Guardrail

This 16-page manual points out requirements of dependable guardrail and gives specific facts on how Armco Flex-Beam guardrail fully meets the need for better protection of motorists on highways and bridges. It contains useful reference data, photos of installations, and a case history record of safety. *Armco Drainage & Metal Products, Inc.*



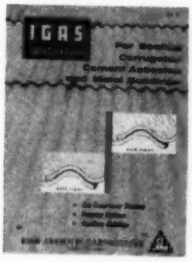
367—Grating and Treads

Gary grating and treads tailor-made to suit your individual requirements are illustrated in a 24-page brochure. Two-page spread includes tables of safe loads, specifications, and other engineering data. Photographs also show many typical applications of the decking. *Standard Steel Spring Div. of Rockwell Spring and Axle Co.*



368—Roofing and Siding

This engineering, architectural, and data manual covers corrugated Asbestone "400" roofing and siding, which is fireproof, weatherproof, rustproof, and permanent. It includes information on stud weld fasteners; Topseal, holegrip, and side-lap fasteners; and staggered and straight joint application. *National Gypsum Co.*



369—Joint Sealers

Four-page booklet GCS-57 outlines a new method of using Igas Joint Sealer to seal the joints in corrugated cement asbestos and metal buildings against infiltration of dust and water. Its use in gas compressor stations in the dust bowl area, in pumping stations, and in similar types of buildings is illustrated. *Sika Chemical Corp.*



370—Interior Wall Finish

Swift's Adcote adhesive finish, a new concept in interior wall finish for board type insulation, refinishing concrete surfaces, resurfacing brick walls, dry wall construction, and applying ceramic tile is described in folder 9383. Principally for cooler and freezer walls, the finish retains its whiteness. *Swift & Co., Adhesive Products Dept.*



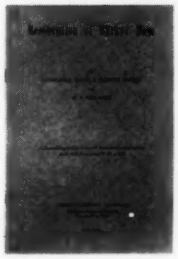
371—Douglas Fir Plywood

Full-page structural drawings that provide basic information on the types, grades, and applications of Douglas fir plywood are contained in this 34-page book. Data on floor, single and double wall construction, roof construction, and excerpts for FHA "minimum property requirements" are included. *Douglas Fir Plywood Assoc.*



372—Iron Aggregate Floors

Material and application information on Masterplate "iron-clad" concrete floors is given in 24-page booklet Mp-4d. It includes test data showing greater wear resistance of this ductile iron aggregate floor. Discussion covers resistance to corrosion, impact, dusting, and spark resistant and static disseminating properties. *The Master Builders Co.*



373—Dam Rehabilitation

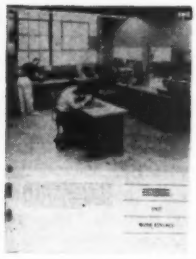
"Restoration of Barker Dam," 34-page booklet, describes the stabilization and restoration of 37-year old Barker Dam with Intrusion-Prepakt's methods and materials. It is illustrated with graphs, charts, and photos showing dam rehabilitations stages employing precast slabs, preplaced aggregate, and pressurized grouting. *Intrusion-Prepakt, Inc.*

To order personal copies of these bulletins, please fill out the card between pages 2 and 3 or 34 and 35.



374—Wrought Iron Uses

"Wrought Iron for Railroads," 36 pages, illustrates some of the outstanding mechanical and engineering railroad applications of wrought iron such as for piping, retarder systems, charging lines, snow melting, car and switch deicing, bridge pier protection, fire curtains, tunnel drains, and similar uses. *A. M. Byers Co.*



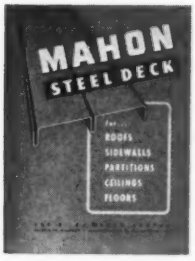
375—Steel Benches

This eight-page review of Hallowell unitized steel benches will allow you to tailor work areas to suit needs. Units can be used singly, back-to-back, or in continuous runs in shop, lab, toolroom, or assembly line. Catalog covers storage accessories, choice of bench tops for various uses, and available parts. *Standard Pressed Steel Co.*



376—Curtain Wall Systems

Curtain wall designs using the Bayley curtain-wall system with aluminum projected windows are illustrated and explained in 28-page bulletin BAPW57. Suitability of this type of window — provided with or without screens — for buildings of all types of construction and architectural treatment is discussed. *The William Bayley Co.*



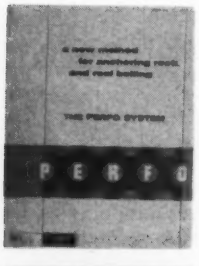
377—Steel Deck

Installation data and detail drawings are given in 16-page catalog D-57 for use of steel deck on any type of building where flat, pitched, or arched roof construction is employed. Examples of its use for sidewalls, partitions, and floors are also shown along with advantages. Specifications and dimensions are given. *R. C. Mahon Co.*



378—Noise Control Products

"Noise Control Products," 32-page catalog AC6.A1, features full-page photos of ceilings, covering the full line of Fiberglas noise control products — acoustical tiles, ceiling board, materials for industrial sound control, and sound absorbing pads for metal pan ceilings. Specifications and drawings are included. *Owens-Corning Fiberglas Corp.*



379—Rock Anchoring

The Perfo system of rock anchoring and roof bolting described in folder 15A features uniform anchorage along the full length of the bolt and high shear resistance. Its use for deep highway cuts, railway cuts, and mine roof bolting is pointed out. Method uses perforated metal pipe, steel reinforcing bar, and mortar. *Sika Chemical Corp.*



380—Welding Studs

Standard designs and specifications of KSM welding studs are covered in 36-page bulletin G-102. It includes a dimensional drawing of each type of fastener, materials in which each is available, plating, annealing, flux, and arc shield data. Brief descriptions of other welding products also are given. *KSM Products, Inc.*



381—Garage Doors

General overhead sectional garage doors, both standard and custom built, are detailed in this eight-page bulletin. It describes carriers, struts, tracks, and low headroom assemblies, and gives photos and drawings of the various types along with specifications, dimensions, weights, and data on applications. *Pick Mfg. Co.*



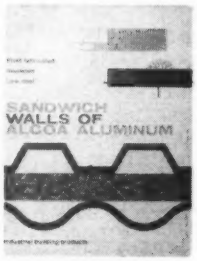
382—Grating

This 16-page catalog shows the three basic types of grating construction; gives more than 30 dimensional drawings of subtypes; eight safe load tables covering steel and aluminum grating, roadway grating, and sidewalk slabs; tables on panel widths, tread widths, and floor armor. Planning layouts are given. *Borden Metal Products Co.*



383—Grating

Safety Grip-Strut, an anti-skid grating in which the vertical members are joined by integral saddle to create lateral struts of great strength, is described in 12-page booklet. General applications, installation and assembly, and fastening devices are discussed. Load tables are given for both steel and aluminum grating. *Globe Co.*



384—Aluminum Sandwich Walls

"Sandwich Walls of Alcoa Aluminum," six-page folder AD 625, explains Alcoa's answer to the erection of low-cost insulated industrial buildings — an inner and outer skin of aluminum industrial building sheet sandwiching a board of glass fiber insulation. Dimensions and finishes are given for roofing and siding. *Aluminum Company of America.*



385—Retaining Walls

This 16-page manual describes how embankments can be stablized or confined along highways, railways, city streets, lakes, or streams with Armco Bin-Type Retaining Walls. Less excavation, simple bolted construction, and adaptation to curves and changes in elevation are discussed. Technical data are given. *Armco Drainage & Metal Products, Inc.*



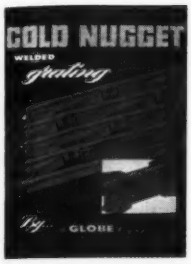
386—Construction Materials

Materials for commercial, industrial, and institutional construction and maintenance are described in 20-page bulletin 9/Ho. It is indexed by product and application, covering such products as hardeners, treatments, and admixtures for concrete; paints, water repellents, and joint materials. *A. C. Horn Co., Inc., Sun Chemical Corp.*



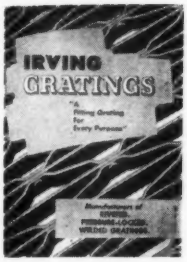
387—Steel Stair Treads

Tread-Grip steel stair treads combine strength of construction with safe, nonslip footing, according to four-page booklet HTP2130. It describes such features as A. W. Algrip nosing, electroforged and welded construction, and twisted cross bars. Detail drawing and tables of dimensions are included. *Horace T. Potts Co.*



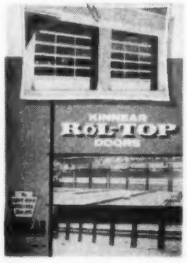
388—Welded Grating

This eight-page bulletin shows details of new lightweight, extra strong Gold Nugget Welded Grating suitable for power houses, loading docks, oil refineries, fire escapes, drain grates, and all types of heavy duty platforms. General engineering data, safe loading tables, and directions for specifying welded grating are given. *The Globe Co.*



389—Grating Products

This grating products catalog contains illustrations, descriptions, and engineering data on grating-flooring, treads, and industrial floor armoring for walkways, stairways, aisles, floors, bridge decking, and many other industrial and commercial uses. Riveted, pressure-locked, and welded type products are shown. *Irving Subway Grating Co., Inc.*



390—Rolling Doors

Twelve-page bulletin 92 demonstrates how both wood and steel RoL-TOP doors, with their straight-line outward appearance, are well suited to modern building needs. Drawings show recommended types for various applications and clearances, types of operation, special features, and dimensions. *Kinnear Mfg. Co.*



391—Rigid Frame Buildings

Stran-Steel's new series of industrial and commercial rigid frame structures, 50 and 60 ft bow string buildings, and Stran-Satin metal wall are detailed in 18-page catalog 56-I-109. Illustrations show these buildings in use as manufacturing plants and warehouses, for retail operations, and municipal installations. *Stran-Steel Corp.*



392—Steel Floor Plate

The hundreds of safety applications for A. W. Algrip abrasive rolled steel floor plate in various types of buildings are outlined in eight-page bulletin 3356. An allowable uniform load table and a table of maximum sizes for plate from ⅛ to ½ in. in thickness are given to assist in selection of the proper plate. *Alan Wood Steel Co.*



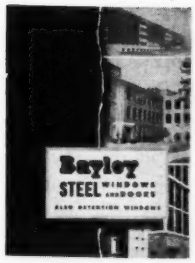
393—Electrified Floors

New 32-page office building manual describes underfloor electrical distribution system in fire-resistant precast concrete cellular floors. It gives design information on long-span Flexicore floor slabs and structural details for office building construction and underfloor electrical distribution layouts. *The Flexicore Co., Inc.*



394—Metal Wall Panels

This catalog for engineers and architects presents Fenestra insulated panels and siding for curtain wall construction. Complete with installation details, span tables, engineering data, and specifications, it gives reasons for using lightweight panel walls. It covers also acoustical wall panels and movable fire partitions. *Fenestra, Inc.*



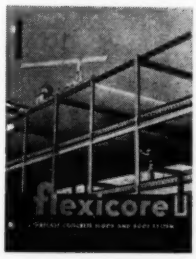
395—Steel Windows and Doors

In 36-page bulletin BSW-57, Bayley steel windows and doors (also operating units and accessories) are shown in layouts and sizes to modular standards recommended by the Metal Window Institute. Included are drawings and specifications for the new intermediate steel window wall, Series S-150. *The William Bayley Co.*



396—Floor Panels and Roof Deck

This catalog of engineering information on the Fenestra line of panels and deck for floors, ceilings, and roofs covers Fenestra Electrifloor (cellular panel plus header duct system), panels for recessed lighting, acoustical panels, complete insulated roofs, and data for designing for seismic shear and wind loads. *Fenestra, Inc.*



397—Precast Floors and Roofs

The Flexicore fire-resistant precast concrete floor and roof system is described in this eight-page bulletin. It includes details on use with structural steel, reinforced concrete, and wall-bearing construction. It gives electrical and mechanical details, load tables, design information, and complete specifications. *The Flexicore Co., Inc.*



398—Bridge Decking

"Decking for Bridges" catalog contains drawings, photos, descriptions, and engineering data on open metal grid bridge roadways. It points out advantages such as light weight, cleanliness, drainage, safety, durability, strength, and traction, as well as the economies effected through minimum maintenance. *Irving Subway Grating Co., Inc.*



399—Design Suggestions

"Ideas for Gold Bond Corrugated Asbestone 'Standard 400'," 16-page form 2381, presents design suggestions to stimulate your imagination. It covers use of the product as roofing and siding for plant exteriors, churches, and schools, and its use in interiors, for fences and walkways. Each application is illustrated. *National Gypsum Co.*



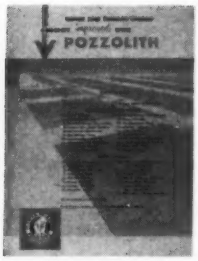
400—Concrete Wall Panels

Insulated precast concrete wall panels and rigid steel framing combined in custom "Panel Bilt" buildings are shown in four-page pamphlet 7285. Panel and structural details are shown for each industrial and commercial purpose described. How this type of construction saves time and money is explained. *The Marietta Concrete Corp.*



401—Hot-Mix Asphalt Paving

"Mix Design Methods for Hot-Mix Asphalt Paving," 168-page book, outlines in detail four methods: Marshall, Hveem, Hubbard-Field, and Smith Triaxial. It includes general information, preparation of test specimens, test procedures, and interpretation of test data for each. Price, $1.00. You will be billed. *The Asphalt Institute.*



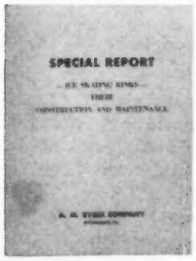
402—Durable Concrete

"Durable concrete" for water works and sewage treatment plants is the subject of 20-page booklet MBR-P-5. It presents 35 representative installations along with case history data on concrete performance obtained under actual operating conditions, and factors to be considered for application of exposed concrete. *The Master Builders Co.*



403—Plywood

This handy pocket size reference booklet contains 60 pages of information on plywood. Ranging from glueline to grade trademarks, it tells of product origin, quality control, FHA acceptance, and describes the advantage of plywood for various purposes. A grade — use chart is included for your convenience. *Douglas Fir Plywood Assoc.*



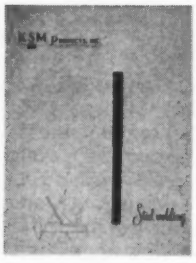
404—Ice Skating Rinks

"Ice Skating Rinks — Their Construction and Maintenance," 32-page special report, includes sections on corrosion control, types of construction, comparative service record data, case history digests of rink installations in various sections of the country, and a list of other helpful technical bulletins. *A. M. Byers Co.*



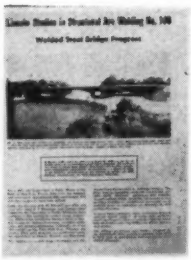
405—Cabinet Benches

Form 2104 is a 12-page review of Hallowell all steel cabinet benches for toolroom, test laboratory, and instrument shop. Units are available with steel, Presswood-covered steel, laminated wood, or ShopTop bench tops. Multiple unit construction and interchangeable accessories facilitate layout. *Standard Pressed Steel Co.*



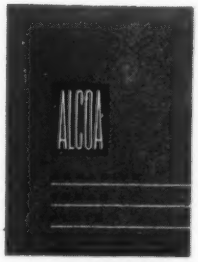
406—Stud Welding

"Stud Welding" is a collection of bulletins covering the various types of construction for which this method of fastening may be used. It includes data on fasteners, equipment, and application methods for fastening aluminum, steel, and asbestos corrugated roofing and siding, and flat asbestos and insulation board. *KSM Products, Inc.*



407—Welded Bridge Design

"Welded Steel Bridge Progress," No. 140 in the series of "Lincoln Studies in Structural Arc Welding," presents information on fabricating and erecting practices, and design data such as joint details, structural members, bases, and flooring. It details recent progress accomplished by arc welding in cost and time savings. *Lincoln Electric Co.*



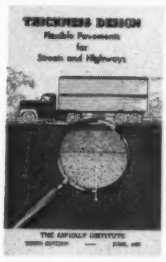
408—Tread Plate

"Alcoa Abrasive Tread Plate," eight-page bulletin AD 596, includes information on applications, design data, available sizes, and fabrication data. Advantages, such as corrosion resistance and light weight, are discussed along with construction—fused aluminum oxide rolled into aluminum base plate. *Aluminum Company of America.*



409—Concrete Structure Repair

This new 12-page *Prepakt Reporter* features case histories regarding the repair of deteriorated plant concrete structures, such as floor supports, bridge piers, and dams. Two technical articles, one on mixed-in-place piles for cut-off walls, and one on deep mine concreting, also are included with photographs. *Intrusion-Prepakt, Inc.*



410—Flexible Pavements

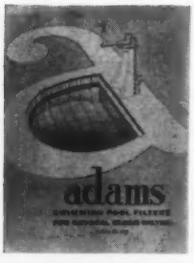
"Thickness Design—Flexible Pavements for Streets and Highways," 44-page booklet, outlines alternate designs for each of a variety of traffic and loading conditions. Included are sections on traffic analysis, materials analysis, alternate designs, and economic considerations. Price, 20¢. You will be billed. *The Asphalt Institute.*



411—Industrial Doors

Bulletin 93, 24 pages, is a complete catalog of the many types of doors made by Kinnear. It gives information on the types of operation, both manual and electrical; elevation drawings; mounting methods for various applications and locations; specifications; and explains special construction features. *Kinnear Mfg. Co.*

WATER TREATMENT AND WASTE DISPOSAL



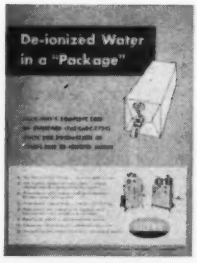
412—Swimming Pool Filters

Bulletin 625, 24 pages, discusses filtration for modern swimming pools of 50,000 gal capacity and over. It has sections on design features of purification and filtering systems, operation phases of filtration cycle, choosing the right filter, installation drawings, dimension charts, and table of filter sizes. *R. P. Adams Co., Inc.*



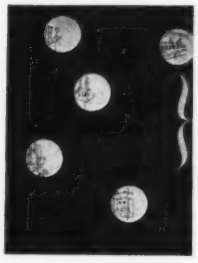
413—De-ionization

Equipment for mixed-bed de-ionization at flow rates of 5 gph to 5000 gpm is described in eight-page bulletin. Diagrams illustrate each phase of operation — service, backwash, simultaneous regeneration, and mixing. Packaged units shipped completely assembled with piping and controls are described briefly. *Illinois Water Treatment Co.*



414—Packaged De-ionizers

"De-ionized Water in a Package," four-page folder PK-256, describes a complete line of standard (package-type) units for production of solids-free de-ionized water. Labeled pictures show units that produce low-solids water and units that produce chemically pure water. Portable de-ionizers are described. *Illinois Water Treatment Co.*



415—Water and Steam Cycles

"Industrial Water Treatment and Engineering Service" tells of the five basic lines of defense to guard against difficulties in water and steam cycles. A two-page diagram shows a water and steam cycle power plant layout and indicates the usual tests required on samples taken at designated points. *Dearborn Chemical Co.*

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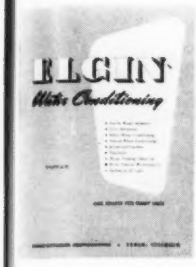
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416—Water Conditioning

Bulletin 611B, 20 pages, describes various equipment employed to condition water for boiler, process, and general uses. It features zeolite water softeners of manual and automatic types, and describes mixed-bed and multi-column deionizers, dealkalizers, ion exchangers, filters, purifiers, and water treating chemicals. *Elgin Softener Corp.*



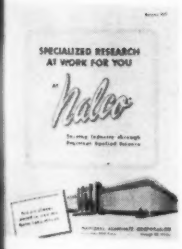
417—Hot Lime Zeolite Method

Bulletin Z-1, four pages, describes the use and advantages of Nalcite HCR hot lime zeolite treatment for boiler feedwater. It includes a schematic drawing of a boiler system and water treating equipment. Analyses of different waters successfully treated for various conditions by Nalcite HCR are listed. *National Aluminate Corp.*



418—Pressure Filters

Three illustrated bulletins on Cochrane vertical pressure filters are available: bulletin 6319 on the type "A" with dome type system underdrain; bulletin 6320 on type "B" with header lateral strainer system underdrain; and bulletin 6321 on type "C" for commercial installations and small industrial plants. *Cochrane Corp.*



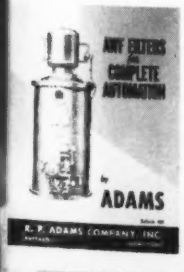
419—Research Facilities

Bulletin 100, eight pages, pictures Nalco research facilities. Brief descriptions of the areas in which the company conducts research are given with information on the type of specialized studies the Nalco staff is prepared to undertake for the consulting engineer working on industrial projects of various kinds. *National Aluminate Corp.*



420—Mixed-Bed Deionizers

Bulletin 512 describes single-column mixed-bed deionizers that deliver high quality water, free from all ionizable impurities including CO_2 and silica, at much less than distillation or evaporation cost. "Double-Check" design that gives added capacity and prevents loss of ion exchange material is described. *Elgin Softener Corp.*



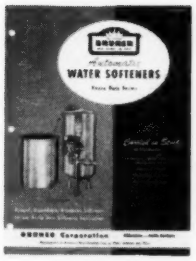
421—Automatic Water Filters

Bulletin 909 is a ten-page booklet with cutaway drawings to show operation of Adams' Automatic Water Filter. Dimension charts and flow curves are given for the three sizes. Applications include process and make-up water and recirculation, waste, and coolant water. Installation photos are included. *R. P. Adams Co., Inc.*



422—Filmeen Treatment

Control of corrosion in return lines through the use of Filmeen treatment is described in eight-page bulletin 5013-B. It explains how this product prevents corrosion caused by CO_2 or oxygen by forming a protective, monomolecular film on metal surfaces. Methods of application and testing are outlined. *Dearborn Chemical Co.*



423—Automatic Water Softeners

Bulletin 400A describes automatic water softeners for heavy duty service. Complete specifications are listed for 17 stock models, with installation diagrams and operation information included. Stock models in capacities up to 1,500,000 grains, single unit; 3,000,000 grains, twin unit. Flow rates are up to 100 gpm. *Bruner Corp.*



424—Fluo-Chlorinator

The Model F-1400 Fluo-Chlorinator for fluoridation and chlorination, designed for simultaneous addition of controlled quantities of both fluoride and chlorine solutions to potable water supplies, is described in catalog 70F140. Operation and construction are covered in text and illustrated by flow and installation diagrams. *Fischer & Porter Co.*



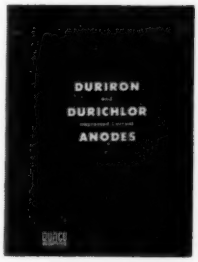
425—Incinerators

"Dravo Continuous Flow Incinerators," folder 1506, describes odorless, smokeless combustion of burnable refuse. The units are adaptable to any site and many existing structures, providing everything from receiving pit to residue discharge conveyor. Automatic control for low initial cost and upkeep is pointed out. *Dravo Corp.*



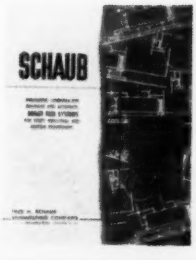
426—Manual Type Softeners

Bulletin 200A deals with manual type softeners with single lever multiport valve control. Complete specifications are listed for 17 stock models, with installation diagrams, descriptions, and operation data included. Capacities are to 1,500,000 grains single unit, 3,000,000 grains twin unit; flow rates to 175 gpm. *Bruner Corp.*



427—Anodes

Duriron and Durichlor anodes for fresh water, ground bed, and salt water applications are described in eight-page bulletin Da/1b. Duriron and Durichlor are high silicon, cast iron alloys possessing almost complete resistance to industrial corrosive materials. Design features, composition, and properties are detailed. *Duriron Co., Inc.*



428—Boiler Water Equipment

Catalog 55-B, 16 pages, fully describes much of the industrial steam and water handling equipment produced by Schaub, including standard boiler return systems, Pree-Heet systems, heat reclaim systems, and deaerating systems. General application and function of each type of system is described. *Fred H. Schaub Engineering Co.*



429—Water Supply

"Supplying Water for Municipal and Industrial Use," 20-page catalog, explains how the Ranney Method can provide any type of water program for these users. Horizontal collectors, infiltration galleries, vertubes, and intakes are fully described. Photographs and schematics depict each operation. *Ranney Method Water Supplies, Inc.*

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ADVERTISERS' LITERATURE

This supplement provides a current and detailed description of bulletins, catalogs, and other literature offered by advertisers in CONSULTING ENGINEER. Products and services offered are grouped into the general categories shown below. A full index is provided on the last page. Keep this supplement in the front of your catalog file and refer to it when you need product data. Four postcards are provided for ordering copies of bulletins you need.

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Bring your Technical Reference Files up to Date

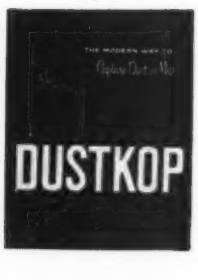
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The Consulting Engineer's Professional Magazine



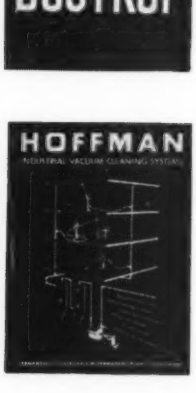
1—Electric Precipitators

The five basic engineering factors governing the success of precipitator installations are fully described and illustrated in a 22-page booklet, "Buell SF Electric Precipitators." Factors include positive gas flow control, uniform electrode emission, rapping method, mechanical construction, and high voltage supply. *Buell Engineering Co.*



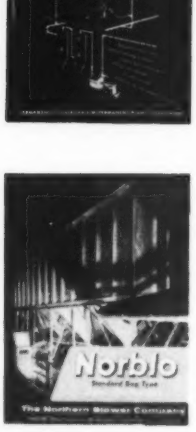
2—Dust and Mist Separation

"The Modern Way to Capture Dust or Mist" describes the cyclone principle of separating dust and mist from air. It contains illustrations of typical Dustkop installations and information on types of equipment available for shipment from stock. Dimensions, specifications, and suggested uses are given for each type. *Aget Mfg. Co.*



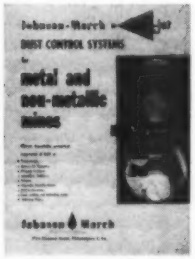
3—Stationary Vacuum Cleaners

Booklet AA-100 describes successful stationary vacuum cleaning for the removal of all kinds of dust, with a detailed description of the systems and their accessories. It details savings and advantages of the systems and outlines ways of solving plant problems of sanitation, quality control, and cost. *U. S. Hoffman Machinery Corp.*



4—Bag-Type Dust Collectors

Four-page bulletin 163-5 describes standard bag type dust collectors designed for non-continuous or intermittent service and lighter dust loads. Cutaway view, elevation drawing, and table of dimensions and capacities are given, along with a description of both the electrical and compressed air shakers. *The Northern Blower Co.*



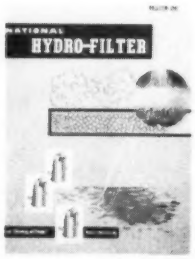
5—Mine Dust Control Systems

Catalog MM-4001, four pages, outlines the outstanding features of new Chem-Jet dust control systems for all phases of materials handling in metal and nonmetallic mines. Photos show typical points of application. It also describes new Type A Hydro-Precipitator for control of gases with dust smaller than 5 microns in size. *Johnson-March Corp.*



6—Air Cleaning Units

Bulletin 5197 features the electronic air cleaning cabinet section with in-line assembly to air distributing units . . . over 90 percent air cleaning efficiency at normal coil face velocities. The electronic air cleaning unit is only 25½ in. in direction of air flow. Collector cells now in standard sizes. *Westinghouse Electric Corp., Sturtevant Div.*



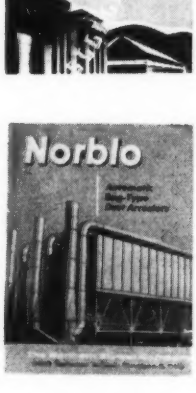
7—Dust Collectors

Outstanding features of the National Hydro-Filter Dust Collector are described in four-page bulletin 556. Ease of operation and maintenance, versatility, cost factors, separating efficiency, controls, and construction and design are discussed. Dimensional data, specifications, and drawings also are provided. *National Dust Collector Corp.*



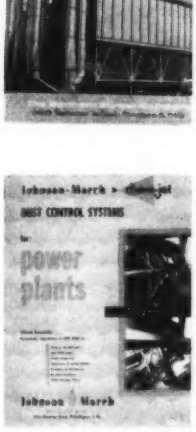
8—Dust Recovery

"The Collection and Recovery of Industrial Dusts" is a 28-page booklet detailing and illustrating all three Buell systems of industrial dust recovery: cyclone, electric precipitator, and low resistance fly ash collector. Indexed bulletin fully covers operating principles, sizing methods, and design details of each. *Buell Engineering Co.*



9—Automatic Dust Collectors

How the Norblo automatic bag-type dust collector can provide continuous operation at full capacity is explained in four-page folder 164-5. Dimensions and capacities are listed in tabular form. A flow diagram explains how the unit works. Each part of the collector is shown separately with a description of advantages. *The Northern Blower Co.*



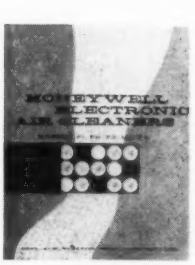
10—Power Plant Dust Control

Six-page catalog SJP-1001 describes new Chem-Jet dust control systems for suppression of coal dust at rotary car dumpers, car shakeouts, track hoppers, conveyor transfer points, coal crushers, reclaim hoppers, and coal storage piles. It includes description of new Type A Hydro-Precipitator Scrubber for dust and fume control. *Johnson-March Corp.*



11—Industrial Dust Control

Forty-page product bulletin 800 contains comprehensive information on all five types of Dracco dust control equipment (cloth filter and cyclonic types). Bulletin is well illustrated and presents dimension and specification data, operating principles, installation case histories, and solutions to dust problems in various industries. *Dracco Corp.*



12—Electronic Air Cleaners

Catalog 76-3335 describes Honeywell's field assembled electronic air cleaners — models F1, F2, F3, and F4. Engineering specifications and operating data are included. Capacities range from 1300 to 138,000 cfm or greater at 85-90 percent efficiency, from 5400 to 144,000 cfm at 95 percent efficiency. *Minneapolis-Honeywell Regulator Co.*

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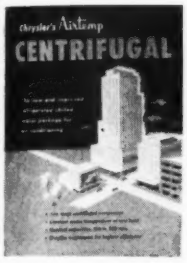
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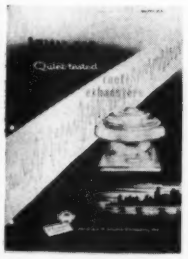
13—Packaged Air Conditioning

The new Airtemp Centrifugal refrigerated water package for air conditioning is described in bulletin AC-285. Features such as two stage centrifugal compressor, constant water temperature at any load, capacities 150 to 500 tons, and 64 evaporator and condenser combinations available are pointed out. *Airtemp Div., Chrysler Corp.*



14—Air Diffusers

Selection Manual No. 60, 80 pages, on air diffusers for air conditioning, heating, and ventilating systems, contains numerous diagrams, tables, and photographs to aid in the selection of the correct units for All-Air high velocity systems, conventional systems, and high temperature differential systems. *Anemostat Corp. of America.*



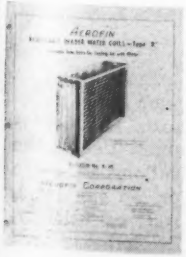
15—Direct Drive Exhausters

Direct drive roof exhausters with capacities from 150 to 4200 cfm are described in four-page bulletin 56-A. Included are noise level recommendations, methods of installation, and an explanation of the U-spring type of vibration isolator featured on Jenn-Air equipment. Performance data is given. *Jenn-Air Products Company, Inc.*



16—Gravity Roof Exhausters

Twelve-page bulletin 100 gives capacities, dimensions, curb details, and construction design of the new AirXpeler Power Gravity Roof Exhausters, units of low silhouette, available as direct or belt driven. Low cost operation for low and high static pressures, and natural draft fresh air supply features are described. *Ammerman Company, Inc.*



17—Cleanable Cooling Coils

Bulletin R-50 describes and illustrates Aerofin Type R Removable-Header Water Coils. These are cleanable-tube extended-surface coils for cooling air with water. Principal advantages are easy cleaning of tubes and positive drainage. Engineering data for various pass arrangements are given to assist in selection. *Aerofin Corp.*



18—Refrigeration

Condensed catalog 493, eight pages, gives complete specification data on refrigeration units—air cooled, combination air and water cooled, and water cooled—in the ¼ through 100 hp range. Single and two stage compressors, compressor units, and condensing units are shown. *The Brunner Div., Dunham-Bush, Inc.*



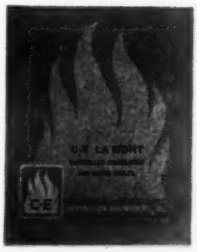
19—Air Conditioning

Precision control of air temperature and moisture enable your client to produce his product in any climate, at any season, according to six-page bulletin 122. The Type "A" air conditioner described, for drying or moistening of air, is shown in typical installation photographs. Drawing points out operation. *Niagara Blower Co.*



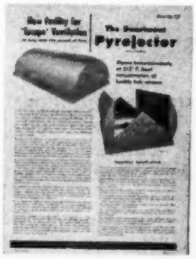
20—High Temperature Water Heating

Basic advantages of the Type LFW Forced Recirculation Generators for high temperature water are given in ten-page bulletin 700. Chart compares capital investment, operating costs, and maintenance and repairs for high temperature water and high pressure steam for district heating from central heating plant. *International Boiler Works Co.*



21—Hot Water Boiler

HCC-2, 20-page brochure, describes and illustrates the design, construction, advantages, and economies of the C-E La Mont controlled circulation hot water boiler for supplying high pressure, high temperature water for heating systems and process applications. Layouts and elevation drawings are given. *Combustion Engineering, Inc.*



22—Fire Vents

A quick-opening fire vent to permit rapid escape of smoke, heat, and gases in event of fire is described and fully illustrated in form 701. Known as the Pyrojector, the unit installs entirely above the roof line and is opened instantly when heat melts a 212 F fusible link. Suggested specifications are given. *The Swartwout Co.*



23—Steam Heating System

"Tune in with the Weather," 16-page bulletin 540, describes Selectotherm, an automatically controlled vacuum steam heating system with a single dial control to balance heat supply against heat loss. A drawing of a typical arrangement is provided, along with specifications, a selector guide, and performance data. *Illinois Engineering Co.*



24—Refrigeration Equipment

New catalog R-400, 12 pages, on refrigeration and air conditioning units, includes Kramer's redesigned Wedge for reach-in refrigerators, Unicon air cooled condensers, Kramer All-Season Winterstat, Coolmaster, and the "L" Thermobank automatic hot gas defrosting system. Selection tables are given. *Kramer Trenton Co.*



25—Smooth-Fin Heat Exchangers

Bulletin S-55 describes new smooth-fin heat-transfer coil construction that permits closer fin spacing, greater capacity per sq ft of face area, and use of higher air velocities without turbulence or excessive friction. It also illustrates many types of extended-surface heat exchangers for heating, cooling, and processing. *Aerofin Corp.*



26—Air Distribution Grilles

The complete line of Uni-Flo air distribution grilles, return registers, and accessories is covered in 24-page catalog 1415-12. In addition to specifications, descriptive information, and photographs of the grilles, the booklet contains data and illustrations of smoke tests demonstrating the performance of the units. *Barber-Colman Co.*



27—Radiant Heating

"Radiant Panel Heating with Steel Pipe," 48 pages, covers the history of this type of heating, basic design, floor, ceiling, and wall panels, information on snow melting systems, pipe coil integration, design of a floor coil system, and a boiler hook-up diagram. *Committee on Steel Pipe Research, American Iron and Steel Institute.*



28—Industrial Air Filters

"The New Cambridge Aerosolve Air Filter," four-page folder, introduces a high efficiency, low pressure drop system of air filters designed for multi-filter banks in comfort and industrial ventilation or air conditioning supply systems. Filter characteristics, advantages, operation, and application data are given. *Cambridge Filter Corp.*



29—Airfoil Fans

Bulletin FD106 includes performance curves, capacities, and construction details of the complete Buffalo Forge Airfoil fan line. This line includes three airfoil and several semi-airfoil wheels to meet a wide variety of operating conditions. Mechanical efficiencies of 92 percent are obtained. Ideally suited for mechanical draft. *Buffalo Forge Co.*



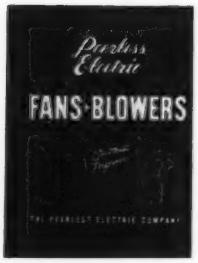
30—Air Control Devices

Catalog 200, 36 pages, "Grilles, Registers, Air Control Devices," lists important features of each type unit, gives horizontal and vertical cross sections, size selection charts, drop chart, construction details, screw hole locations, dimensions, specifications, price lists, and engineering data. *Tuttle & Bailey, div. of Allied Thermal Corp.*



31—Cooling Towers

Catalog No. 361 describes the new line of Flow-Mizer cooling towers. Featuring the new Plastic Pak, these towers are offered in ten models from 20 to 175 tons capacity. Catalog furnishes complete selection data along with full dimension drawings for all models and complete specifications and dimensions. *Acme Industries, Inc.*



32—Exhaust Fans

Eighteen-page bulletin SDA-160 gives features, capacities, performance data, and dimensions for commercial and industrial exhaust fans; vertical or horizontal Ventilattic fans; penthouses; automatic wall and ceiling type louvers; belt drive utility blowers; direct drive blowers; and radial blade blowers. *Peerless Electric Co.*



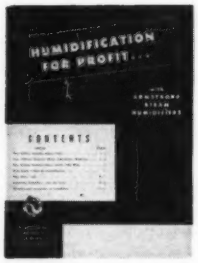
33—Air Filters

"The Amazing Story of the Absolute Filter," eight-page bulletin 106A, tells about the development of the filter for the Atomic Energy Commission and its subsequent "declassification" for use in industry where critical air cleaning problems exist. Construction, dimensions, applications, and ratings are given. *Cambridge Filter Corp.*



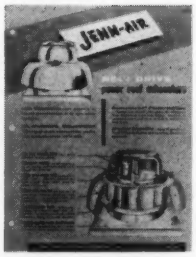
34—Air Engineering Folder

New 24-page "Air Engineering Data File," bulletin E-57, covers engineering and test facilities for propeller fans, specifications, construction, maintenance, and installation. Tables for estimating air handling requirements, entrance and elbow losses, and duct sizes are included along with data on special units. *Aerovent Fan Co.*



35—Steam Humidifiers

"Humidification for Profit," 16-page bulletin 500, presents statistics that show how relative humidity affects hygroscopic materials, health and comfort, and formation of static electricity. Schematic diagrams and sectional drawings demonstrate operation of electrically and air operated steam humidifiers. *Armstrong Machine Works.*



36—Roof Exhausters

Catalog 55-A, on the Jenn-Air belt driven roof exhausters, gives full data on a range of capacities from 1700 cfm to 13,400 cfm, and shows a cutaway drawing with a list of component parts of the exhauster. Recommended installation information is included, along with specifications and dimensions. *Jenn-Air Products Company, Inc.*



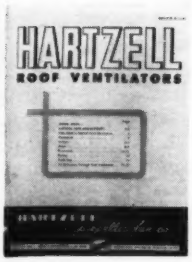
37—Bifurcator Fans

Catalog DB-37-55, 16 pages, describes operation of the Bifurcator Fan, a split-housing fan that exhausts hot, corrosive, and flammable fumes. Use of the bulletin makes fan selection easy since it gives full information on fan laws, static pressure, and charts on velocity, pressure, and friction. *De Bothezat Fans Div., American Machine & Metals, Inc.*



38—Air Filters

New four-page bulletin 780 presents complete data on the Roll-O-Vent, and describes operation of the continuous Roll-O-Mat filtering media that is fed into the air stream from supply spool to rewind spool. Diagrams and size charts are given for the basic Roll-O-Vent, and also for accessories used with the unit. *American Air Filter Co., Inc.*



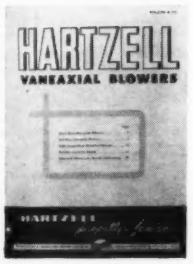
39—Roof Ventilators

Bulletin A-112, 16 pages, gives descriptions, specifications, dimensions, and performance data on the complete line of Hartzell roof ventilators, including the new reversible model, two vertical discharge models (Vertijet and Airjet), and a fan-powered rotary ventilator. Data on penthouses are included. *Hartzell Propeller Fan Co.*



40—Centrifugal Roof Ventilators

Eight-page folder SDA-220 presents the new Peerless Centrifugal Roof Ventilator. Features, construction details, complete performance data, dimensions, detail drawings, and recommended specifications are given. Other fan and blower products also are described. Engineering data are in table form for handy reference. *The Peerless Electric Co.*



41—Vaneaxial Blowers

Sixteen-page bulletin A-110 gives descriptions, specifications, dimensions, and performance data on direct drive, belt driven, high temperature vaneaxial blowers in sizes from 12 to 54 in., including portable vaneaxial blowers. Blowers are listed for use against pressures as high as 7½-in. water gage. *Hartzell Propeller Fan Co.*



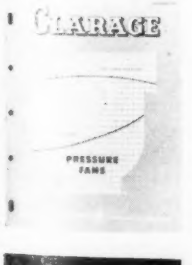
42—Roof Ventilators

"Penn Airette Ventilators," six-page bulletin PA 14 B, describes direct or V-belt driven exhaust or supply propeller fan roof ventilators. Sketches show low, clean contours of the units. Capacity tables, dimensional charts, and data on mounting bases, construction, and operation are included with specifications. *The Penn Ventilator Co.*



43—Corrosion Resistant Fans

Bulletin FI511 gives chemical resistance and physical properties data for this new Buffalo resin-bonded glass fiber fan available in capacities to 34,000 cfm. This glass fiber material has high impact resistance and will not support combustion. Since the airstream does not come in contact with metal, fan life is extended. *Buffalo Forge Co.*



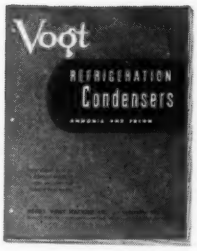
44—Pressure Fans

A new line of fans designed for 10 to 50 in. wg static pressure and 300 to 12,000 cfm is described in the 20 pages of catalog 855. Fans of cast iron as well as sheet steel construction are available. Complete performance data, dimensions, and convenient fan selector charts are included along with other engineering data. *Clarage Fan Co.*



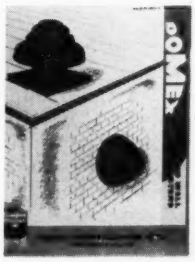
45—Ceiling Diffusers

Catalog 108, "Aerofuse Ceiling Diffusers," 72 pages, gives complete information on diffusers, volume control dampers, distributing grids, blanking baffles, plaster rings, and anti-smudge rings. It gives size selection charts for installation in different locations, dimensions, and engineering data. *Tuttle & Bailey, div. of Allied Thermal Corp.*



46—Refrigerant Condensers

Engineering data on a complete range of sizes and types of condensers for ammonia and freon refrigerants are given in 40-page bulletin RC-2, "Refrigeration Condensers." Closed, horizontal multipass types, and open, vertical singlepass types are featured. Piping sizes and temperature tables also are included. *Henry Vogt Machine Co., Inc.*



47—Roof and Wall Exhausters

"Penn Domex Roof and Wall Exhausters," six-page bulletin DMX-18, describes durability of aluminum spun into weatherproof housing for centrifugal fans for modern buildings. Capacity tables, dimensional charts, and details of new Sonotrol Curb for reducing sound build-up at source are given. *The Penn Ventilator Co.*



48—Powered Rotary Roof Ventilators

Positive powered ventilation when the need arises or economical gravity exhaust of contaminated air are the twofold possibilities with the Swartwout Airjector, described in eight-page bulletin AJ-2. Standard type, in 13 sizes and 100 capacity variations, are detailed, as is the "very quiet" model for special uses. *The Swartwout Co.*



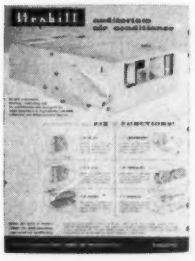
49—Induced Fan Bifurcators

This 20-page catalog, DB-44-56, tells about the DeBothezat Induced Draft Bifurcator for providing constant boiler draft. It simplifies analysis of induced fan requirements and gives all manufacturers' boiler code ratings reduced to relationship of Btu per hr delivered to the steam. *DeBothezat Fans Div., American Machine and Metals, Inc.*



50—Evaporative Condensers

Eight-page catalog 311 furnishes complete information on a new line of Flow-Mizer evaporative condensers. The line consists of eleven models in capacities to 200 tons. Capacity tables and selection data are furnished for both freon and ammonia circuits. It also includes full dimension drawings and engineering specifications. *Acme Industries, Inc.*



51—Auditorium Air Conditioner

Publication AC-1 describes a new large volume air conditioning unit for quiet operation in school auditoriums, libraries, cafeterias, and administration spaces. This versatile unit heats, cools, filters, dehumidifies, ventilates, and silences. 16 models are available, 1250 to 15,000 cfm, 3 to 60 tons cooling, 3600 to 1,300,000 Btu. *John J. Nesbitt, Inc.*



52—Industrial Fans

The new, improved line of Macheta direct-driven industrial fans, available in ring and square panel types, is described in this bulletin. Units are shown for use in all positions, ceiling, wall, or penthouse. Fans are in 12- to 96-in. diameters, with 2, 4, or 6 blades, and with capacities from 600 to 145,000 cfm. *Aerovent Fan Co.*



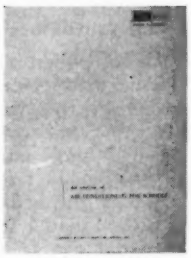
53—Steam and Hot Water Units

Booklet 20 gives general specifications, standard ratings, and dimensions of Cyclotherm generators, with discussion of Cyclotherm combustion principle in which air enters cylindrical fire tube at a tangent and with velocities up to 200 mph. The result is minimum 80 percent efficiency in only two passes. *Cyclotherm Div., National-U.S. Radiator Corp.*



54—Utility Sets

Bulletin 8414, 28 pages, describes the new line of HS utility sets. It covers features and advantages, gives selection factors, tables of minimum outdoor air requirements, recommended duct velocities, outlet velocity, tip speed values for backward inclined blade fans, and correction ratios for temperature and altitude. *American Blower Corp.*



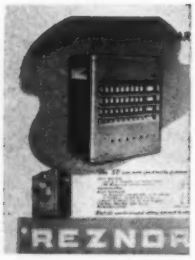
55—School Air Conditioning

"An Analysis of Air Conditioning for Schools," publication 10G10, discusses the subject of year-round school air conditioning. Twelve-page thesis considers the factors involved in school comfort, school building design, summer and winter design requirements, and typical loads and costs. Recommendations are given. *John J. Nesbitt, Inc.*



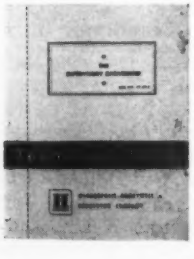
56—Rotary Postitive Blowers

Bulletin AF-154 contains descriptive information and operating data regarding rotary positive blowers of seven inches gear diameter and smaller. These blowers are rated from 1 to 7 psig and will handle from 10 to 700 cfm of air. Included in this bulletin are selection and dimension tables, performance data, drawings. *Roots-Connersville Blower.*



57—Gas Heating Equipment

Catalog GN-57 deals with a complete line of gas-fired commercial and industrial heating equipment, including suspended gas unit heaters, both fan and blower types; the Flexitemp floor model heater; two series of duct furnaces; and a horizontal furnace. It includes complete specifications and construction details. *Reznor Mfg. Co.*



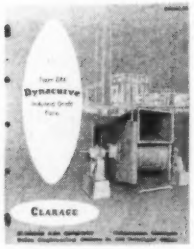
58—Supervisory DataCenter

Technical data bulletin 77-0111 contains information regarding Supervisory DataCenter panels. Panel specifications are given along with complete ordering information. Ten standard modules are sketched as well as a typical Supervisory DataCenter. Each unit is built to customer's specifications. *Minneapolis-Honeywell Regulator Co.*



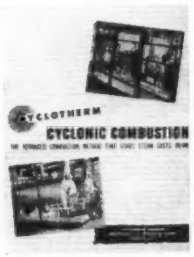
59—Evaporative Condensers

Catalog 9H-26 deals with a new type of evaporative condenser with capacities from 5 to 250 tons that does not require spray nozzles or eliminators, saves 95 percent of water normally used. Capacity and fan performance ratings are listed for 13 models, with physical data, dimensions, and guide specifications. *Carrier Corp.*



60—Induced Draft Fans

Catalog 905 covers the new Type DN Dynacurve Fan which introduces a new concept of induced draft equipment design. Distinguishing features are listed as: low tip speed, 36 aerodynamically curved blades, minimum space requirements, and high efficiency over wide performance range. Various arrangements are shown. *Clarage Fan Co.*



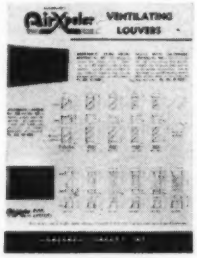
61—Steam and Hot Water Units

Booklet 22, "Cyclotherm Cyclonic Combustion," describes combustion principle of Cyclotherm steam and hot water generators. Air enters cylindrical combustion chamber at a tangent and with velocities up to 200 mph, giving a minimum of 80 percent efficiency in only two passes. *Cyclotherm Div., National-U.S. Radiator Corp.*



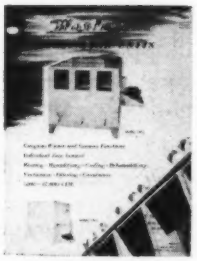
62—Industrial Fans

Bulletin EX-531 describes fans for exhaust ventilation, pneumatic conveying, induced draft, and oven circulation. Medium speed, the design lends itself to protective treatment and other demands of industrial applications involving corrosion and abrasion. Stock sizes 200 to 55,000 cfm, pressures 1 to 15 in. sp. *Bayley Blower Co.*



63—Louvers and Fire Dampers

Four page bulletin L-D-S-57 gives complete information on louvers, fire, air control, and back pressure dampers. All fire dampers can be made to meet NBFU specifications per pamphlet 90-A. Photo shows adjustable louver with geared crank controller and other types of units and their accessories. *Ammerman Co., Inc.*



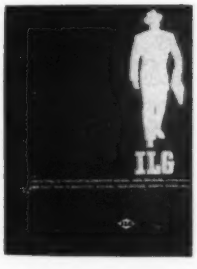
64—Multi-Zone Units

Eight-page bulletin 3155 describes Marlo Multi-Zone units, horizontal and vertical models designed to perform complete winter and summer functions where one unit must serve several zones. Cutaway and exploded views illustrate construction features. Charts cover complete range of 15 sizes from 1300 to 37,000 cfm. *Marlo Coil Co.*



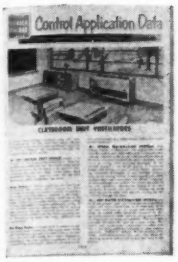
65—Steel Boilers

"Your Wonderful Winters" covers beauty, comfort, and economy of hot water heat with cutaway views and descriptions of three series of welded steel boilers, ranging from 74,000 to 243,000 Btu per hr. 24 pages of text and full-color illustrations include sidewalk snow melting applications. *American-Standard, Kewanee Boiler Div.*



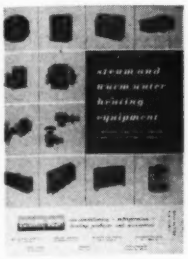
66—School Ventilation

Four-page folder tells how Ilg field engineers can serve consulting engineers by providing them promptly with up-to-date information. Bulletin No. 5 shows a variety of Ilg ventilating equipment — power roof ventilators, wall ventilators, "fly fans," and unit heaters — in use at East End Elementary and other schools. *Ilg Electric Ventilating Co.*



67—Unit Ventilator Control

How to determine the proper control system for classroom unit ventilators is discussed in bulletin CA-16. Illustrated with drawings of various types of unit ventilators, the bulletin describes the correct control application for each, for a central heat source, steam distribution systems, and hot water distribution systems. *Barber-Colman Co.*



68—Heating Equipment

Bulletin 1101F describes steam and warm water heating equipment, including everything in radiation, controls, pumps, unit heaters, and specialties. Illustrations, specifications, and installation diagrams on more than 30 pieces of equipment are given. Included is a list of cities in which the company has sales engineers. *Dunham-Bush, Inc.*



69—Fan Ventilators

Bulletin SPV-18 describes high exhaust capacity of Burt "F.E.F." ventilators for rapid removal of smoke, fumes, dust, and heat. Because of its absolute free opening when in operation this unit has higher capacities than other types. Capacities range from 5000 to 75,550 cfm. Complete size and dimensional data are included. *The Burt Mfg. Co.*



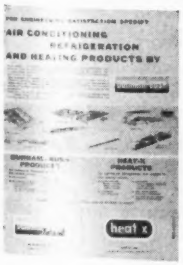
70—Unit Heaters

Catalog 1523 illustrates the complete new line of Westinghouse unit heaters (steam or hot water application) featuring large heating capacities with positive air circulation for installations where speedy space heating is required. Capacities are 265 to 11,500 cfm; 15,000 to 684,000 Btu per hr. *Westinghouse Electric Corp., Sturtevant Div.*



71—Central Station Units

Twelve-page illustrated bulletin 3055 describes Marlo's floor and ceiling type central station units for heating, humidifying, cooling, dehumidifying, filtering, and circulating, in 17 sizes from 1 to 175 tons. The bulletin includes illustrations and descriptions of components, with construction and performance data. *Marlo Coil Co.*



72—Heating and Cooling Products

Bulletin 6002 describes air conditioning and refrigeration products, sales, and service. Specifications, dimensions, and capacities of air handling units, blower condensers, evaporative condensers, and cooling towers are given. Included is information on water chillers, package chillers, and liquid coolers. *Heat-X, Inc., subsidiary of Dunham-Bush, Inc.*



73—Airfoil Centrifugal Fans

New 32-page bulletin 257 provides complete specifications and capacity data on Type BC airfoil centrifugal fans: direct-connected and belted models; outlet velocity from 800 to 4600 ft per min; air moving capacities from 688 to 24,912 cfm, for all types of air conditioning and ventilating installations. *Ilg Electric Ventilating Co.*



74—Space Heaters

Bulletin No. 564 describes an entirely new concept of burning fuels in direct-fired forced-air space heaters. Separate sections discuss the new burner and combustion chamber, and tables provide dimensions and engineering data. Heaters are available in output capacities from 250,000 to 2,000,000 Btu per hr. *Dravo Corp.*



75—Ramfeed Stokers

Bulletin 456 illustrates the Lo-Set Ramfeed stoker line including flexible assemblies for making compact installations in limited space. Canton "Synchro" combustion controls that keep coal feed, forced air, and stack draft in positive balance are described. Turbo-Aire lets you comply with smoke regulations. *Canton Stoker Corp.*



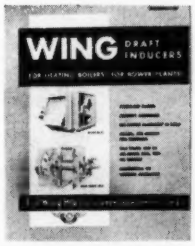
76—Revolving Unit Heaters

Bulletin HR-6A features Wing revolving unit heaters, which employ a method of distributing heat to all parts of working area by revolving discharge of overhead unit heaters. It contains engineering data, specifications, dimensions, and installation planning data to make specification writing simple. *L. J. Wing Mfg. Co.*



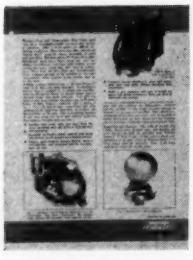
77—Direct Fired Space Heaters

Bulletin F-57A-RO gives complete description and specifications on Reznor-Olson stainless steel direct-fired heaters designed for large commercial and industrial space heating applications. Models come in ten sizes from 400,000 to 2,000,000 Btu for gas, oil, or dual-fuel firing, for free-standing or suspended installation. *Reznor Mfg. Co.*



78—Draft Inducers

Bulletin I-57, 24 pages, describes Wing draft inducers for heating boilers and power plants, covering capacities up to 120,000 lbs steam per hr to give constant, uniform draft, regardless of weather, without tall, costly chimneys. The bulletin contains selection data, capacity curves, tables, and installation illustrations. *L. J. Wing Mfg. Co.*



79—Drip Traps

Bulletin B-712F describes a number of Warren Webster float and thermostatic drip traps in sizes from ¾ to 2 inches. It gives ratings and dimension differences from ⅛ to 15 lbs per sq in., drawings and cutaway views of various traps and their component parts, and describes operating features. *Warren Webster & Co.*



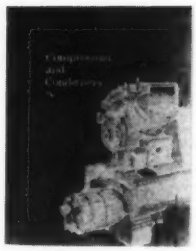
80—Continuous Ridge Ventilators

Burt continuous ridge type ventilators are described in two bulletins: SPV-6A for sizes up to 24-in. throat and SPV-6B for 30- to 96-in. throat. Design and construction, dampers, capacities, mounting, and flashing details are included. This highly efficient gravity unit has been installed in runs from one to 500 feet. *The Burt Mfg. Co.*



81—Strainers

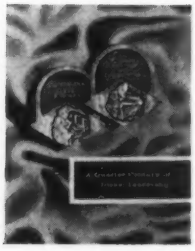
Bulletin B-709B describes a complete line of Y-type strainers with screwed connections from ⅜ to 2 inches with iron or brass bodies and flange connections in sizes from 2 to 12 inches. Bulletin gives complete dimensions and specifications and ratio of free area to pipe area. Units are for steam, water, and gas. *Warren Webster & Co.*



82—Condensers and Compressors

Catalog 5FH48 deals with Carrier's extensive line of reciprocating compressors and condensers ranging in capacity from 5 to 150 hp. Equipment can be used for air conditioning and commercial and industrial refrigeration. Complete compressor and condenser ratings, physical data, selection examples, and specifications are included. *Carrier Corp.*

ELECTRICAL EQUIPMENT



83—Diesel Engines

Booklet 717-32390-D703, "A Quarter Century of Diesel Leadership," traces Caterpillar's development of the modern heavy-duty diesel engine over the past 25 years. Illustrated throughout with photographs and drawings, this brochure describes Cat diesel engines, diesel marine engines, and electric sets. *Caterpillar Tractor Co.*



88—Control Centers

Catalog SM-244, 16 pages, describes in detail the modern method for centralizing electrical power distribution and motor control equipment for industrial applications. It also contains suggested ideas for control specifications, and gives a simplified selector for use in control center layout and planning. *Square D Company.*



84—Bus Duct Manual

"Bus Duct Manual," 72-page bulletin B-4272B, is designed for consultants' use in planning and selection of units for bus duct layout in commercial, institutional, and industrial buildings. Plug-in duct, weather-proof feeder duct, low-impedance duct, and weather-proof low-impedance duct are fully covered. *Westinghouse Electric Corp.*



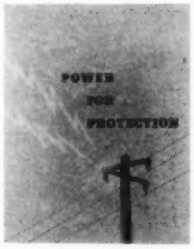
89—Paper-Lead Power Cable

Publication C-89 provides thorough information about Anaconda Type CB paper cable and F-3 alloy sheath. The patented carbon-black-tape feature is described, in addition to important operating characteristics and engineering test results. Complete treatment is given to F-3 alloy-lead sheath, also patented. *Anaconda Wire & Cable Co.*



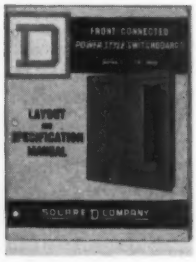
85—Disconnectors

Bulletin 140, 36 pages, describes 3E Isolators for disconnecting equipment and cables, in ratings up to 15,000 v and 1200 amp. It lists points to be considered when ordering, shows the units in typical applications, and gives dimensional drawings, cutaways, and specifications for the various types. *Electrical Engineers Equipment Co.*



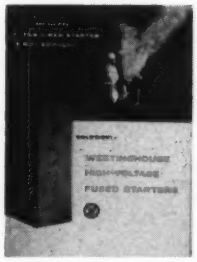
90—Standby Power

Booklet 717-32484-D721, "Power for Protection," describes the varied communications, service, and commercial uses of diesel electric sets in standby power applications. Illustrated throughout with photographs and drawings, this brochure lists brief specifications for Cat constant-voltage self-regulated electric sets. *Caterpillar Tractor Co.*



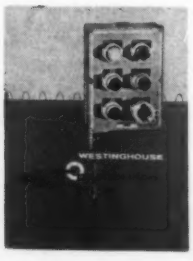
86—Layout Manual

This 67-page manual, specifically intended for the consulting engineer, consists entirely of layout arrangements, bussing diagrams, conduit entrance data, description of construction and arrangement, and suggested specifications. It covers switchboards most suitable for requirements between 400 and 2000 amp. *Square D Company.*



91—Fused Starters

"For industrial high-voltage systems a 'ten times starter' is not enough," according to 12-page booklet B-6535. It tells how high-voltage, fused starters give protection to the system, personnel, and motors. Horsepower ratings and representative types of starters available for a-c motors are listed. *Westinghouse Electric Corp.*



87—Pushbutton Guide

Bulletin B-6749 is a complete 76-page guide containing illustrations, application data, dimensions, and prices of a complete line of industrial pushbuttons. Whether the application calls for standard duty, heavy duty, Oil-tite, or special service control stations, this easy-to-read catalog will give the answer. *Westinghouse Electric Corp.*



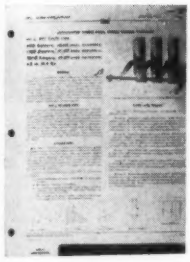
92—Electrified Floors

New 32-page office building manual describes underfloor electrical distribution system in fire-resistant precast concrete cellular floors. It gives design information on long-span Flexicore floor slabs and structural details for office building construction and underfloor electrical distribution layouts. *The Flexicore Co., Inc.*



93—High Voltage Insulation

Exceptional characteristics of Anaconda Type AB butyl-rubber insulation in high-voltage applications are highlighted in engineering bulletin EB-27, 12 pages. It details results of tests in which Type AB compound demonstrated unusual ozone resistance, long aging performance, and good power factor stability. *Anaconda Wire & Cable Co.*



94—Interrupter Switches

This complete set of catalog handbook pages includes application, descriptions, dimensions, details, and prices of type HPL-C interrupter switches. They give detailed information on specifying, explain and illustrate operating mechanisms, describe accessories, and give engineering data. *R & IE Equipment Div., I-T-E Circuit Breaker Co.*



95—Connector Bodies

Insulprene Twist-Lock connector bodies, 25 amp, 250 v, are covered in this bulletin. It explains advantages of Insulprene, a neoprene composition that resists hot water, live steam, outdoor atmospheric conditions, grease, oil, and many acids, and lists the eight ways in which these connectors are superior. *Harvey Hubbell, Inc.*



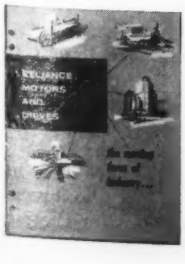
96—Specialty Transformers

Dry-type specialty transformers for commercial building application, designed for a noise level of 45 decibels or below, are described and illustrated in bulletin GEC-1432. Prices, dimensions, applications, and wiring diagrams are given for single and three-phase transformers for indoor and outdoor use. *General Electric Co.*



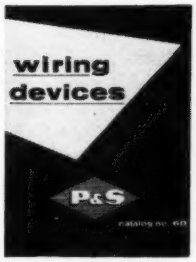
97—Hydraulic-Magnetic Breakers

Bulletin 201, 22-page engineering guide, covers application of Heinemann hydraulic-magnetic circuit breakers. It explains how they provide inverse time delay plus high speed short circuit interruption, and gives time delay curves for motor control, general lighting, and special circuits. It lists rated capacities. *Heinemann Electric Co.*



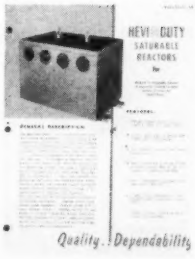
98—Motors and Drivers

New eight-page, two-color booklet A-2501, "The Moving Force of Industry," describes a complete line of a-c and d-c motors, Reeves drives, V*S variable-speed drives, motor controls, motor-generator sets, and gearmotors for all types of industrial applications. Specifications and dimensions are given. *Reliance Electric and Engineering Co.*



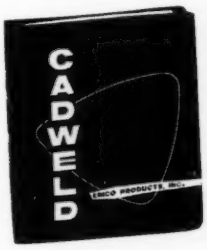
99—Wiring Devices

Catalog 60 features 75 illustrated pages describing a complete range of electrical wiring devices in both the interchangeable Despard line and the P&S conventional line. Everything from switches to fixtures — devices for every conceivable purpose — are listed. A 15-page index and price list is included. *Pass & Seymour, Inc.*



100—Saturable Reactors

Hevi-Duty Saturable Reactors for manual or automatic control of power to a load are described in four-page bulletin 500. Suggested uses include stepless control of electrically heated equipment, reduced voltage in a-c motor starting circuits, and as loading reactors for test boards. Dimensions are given. *Hevi-Duty Electric Co.*



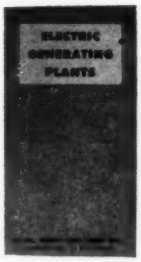
101—Electrical Connections

Completely new 104-page electrical connection catalog covers exothermic method of welding copper to copper or steel without an outside source of heat. All types of connections for cable, ground rod, cable to steel surface, cable to bus bar and tube, bus bar single or multiple, tubular bus bar, and studs are illustrated. *Erico Products, Inc.*



102—Circuit Breakers

This 68-page catalog contains important data on the complete line of I-T-E molded case circuit breakers, Cordon current limiting circuit breakers, and individually enclosed large air circuit breakers. Information includes selection, application, and dimensions for ratings from 15 to 4000 amps, 250-v dc, 600-v ac. *I-T-E Circuit Breaker Co.*



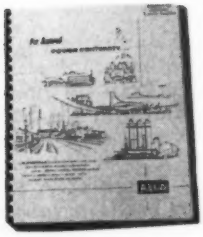
103—Electric Generating Plants

A "Blue Book" of general information on selection of engine-driven electric generating plants, this pocket-sized booklet traces development of electric plants from early stages to today's modern units. It reviews three general groups of electric plants: a-c, d-c, and battery with points to consider in selection. *D. W. Onan & Sons Inc.*



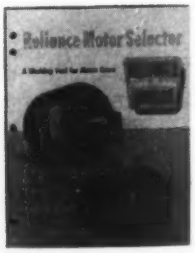
104—Package Drives

Complete a-c to d-c conversion units for use with wide range variable speed d-c drives from 5 to 200 hp are featured in eight-page bulletin 51B8166A. The booklet explains how package drives work, describes component parts, and suggests applications. Also shown is a typical schematic diagram. *Allis-Chalmers Mfg. Co.*



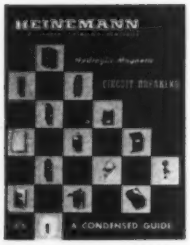
105—Automatic Transfer Switches

Catalog 57-S1 provides comprehensive engineering data arranged to simplify selection of transfer switches. Catalog includes application, construction, and operational information, along with list prices, dimensions, and weights. Modified arrangements are shown for microwave, subway, turnpike, and atomic energy uses. *Automatic Switch Co.*



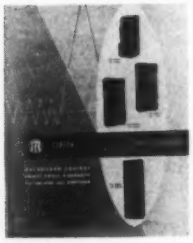
106—Motor Selector

Twelve-page booklet B-2103-2 gives wealth of valuable information for any industrial a-c motor user. Included are NEMA design classes, torque characteristics, speed-frequency relationship, current-torque selection table, frame selection table, and specifications for motors in frame sizes from 182 to 6085. *Reliance Electric and Engineering Co.*



107—Circuit Breakers

Bulletin 301, 16 pages, describes operation and application of Heinemann hydraulic-magnetic circuit breakers. It lists a complete line of 1-, 2-, and 3-pole breakers; gives standard current ratings (0.010 to 100 amps); shows time delay characteristics for branch and motor control circuits; and has UL listings. *Heinemann Electric Co.*



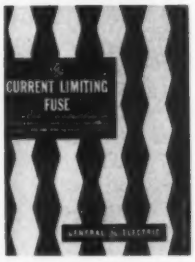
108—Cordon Circuit Breakers

Bulletin 5042-A describes the design and operating characteristics of the new current limiting type circuit breaker. These devices, called Cordon circuit breakers, provide an economical means of obtaining fault protection up to 100,000 amps without sacrificing operating features of standard type circuit breaker. *I-T-E Circuit Breaker Co.*



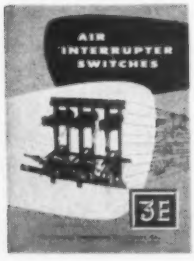
109—Modern Wiring Devices

Eight-page illustrated catalog, "P&S Modern Wiring Devices," describes the P&S Roto-Glo quiet switch and highlights some of the outstanding P&S grounding outlets, weatherproof outlets, lampholders, Alabax fixtures, and the Despard line of interchangeable devices. A list of P&S representatives is furnished. *Pass & Seymour, Inc.*



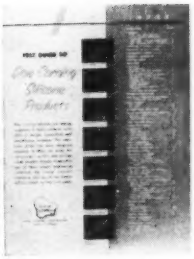
110—Current-Limiting Fuses

The General Electric CLF high interrupting capacity, current-limiting fuse primarily designed for application on low voltage circuits where the available short circuit currents exceed values that conventional NEC fuses can interrupt successfully are illustrated and described in eight-page bulletin GEA-6319C. *General Electric Co.*



111—Air Interrupter Switches

Bulletin 152 lists and illustrates a complete line of dry-type and liquid-filled switches through 14.4 kv. Units offer Auto-Speed interruption and automatically produced interruption that occur at the same point in the switching operation and take ½ cycle. Ratings, dimensions, and specifications are given. *Electrical Engineers Equipment Co.*



112—Guide to Silicone Products

Brochure 1-112 details more than fifty different uses for silicone products. Basic properties of various silicone materials, their application, and the benefits obtained by specifying original equipment using silicones are described. Topics include silicone insulated motors and transformers, and silicone protective coatings. *Dow Corning Corp.*



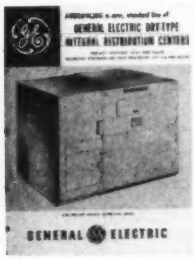
113—Cooling System

"Versatile Vacu-Flo Plants for Buildings and Vehicles," Vol. 12, No. 4 of *Power Points Digest*, tells how various installations of Onan electric plants in buildings and vehicles are using the exclusive Onan "Vacu-Flo" cooling system to solve their engine cooling problems particularly in small spaces. *D. W. Onan & Sons Inc.*



114—Weather-Protected Motors

Newly redesigned motors for outdoor operation are described in bulletin 51B8606A. Rated 250 hp and above, these motors are of particular interest for utilities, pipelines and refineries, paper mills, and the mining industry. Bulletin describes many new construction features including capsule-mounted bearings. *Allis-Chalmers Mfg. Co.*



115—Distribution Centers

General Electric's new standard line of dry-type integral distribution centers, primary voltages 15 kv and below, secondary voltages 600 v and below, 225 kva and below, are described in bulletin GEA-6649. Features such as savings in space, choice of incoming line components, and integral design are pointed out. *General Electric Co.*



116—Manufacturing Facilities

"The Four Minute Tour" is a word and picture trip through the facilities and offices of Continental Wire. It points out some of the machines and operations used to make insulated wire and cable: taping heads, extruder, winder, braiding machinery, carders, varnishing towers, and types of inspection at each point. *Continental Wire Corp.*



117—Industrial TV

Bulletin 2140 features a closed circuit industrial television system with a compact camera for use with standard TV broadcast receiver or a video monitor. Picture quality, simplicity of operation, and dependability are featured. Camera control unit may be 500 feet from camera or farther with special equipment. *Diamond Power Specialty Corp.*



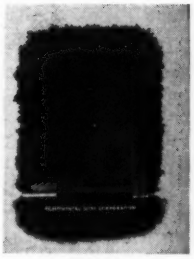
118—Control Centers

"Westinghouse Control Centers," 32-page bulletin, analyzes advantages gained with control centers in small shops with a few motors, office buildings, stores, power plants, and in large industries. Charts and tables are included to help you select the proper control center arrangement for the job. *Westinghouse Electric Corp.*



119—Transformers

Bulletin 100, four pages, contains in table form statistical information on capacities, prices, approximate dimensions, temperature rise, and weight of the entire line of single phase power and lighting transformers made by Hevi-Duty. Dimensional drawings and photos are given for each type of unit. *Hevi-Duty Electric Co.*



120—Wire and Cable

"Wire & Cable for American Industry," 72-page catalog, gives construction specifications for all types of wire and cable, such as: apparatus, appliance, audio, boiler room, building, coaxial, control, gasoline resistant, instrument, mining, power, railway signal, remote control, street lighting, and many other types. *Continental Wire Corp.*

ENGINEERS' EQUIPMENT AND SUPPLIES



121—Convertible Level

Four-page folder 40F includes illustrations, description, and specifications of the newly designed Warren-Knight convertible level. It gives ten reasons why this instrument has no equal for general engineering construction work. Bulletin includes prices, terms, and ten days free trial offer of instrument without expense. *Warren-Knight Co.*



123—Products Catalogs

These ten illustrated catalogs, each covering one type of engineering or drafting equipment made by Post for the engineer, include complete listings of sensitized products, reproduction machines, tracing and drawing media, drafting equipment, drafting room furniture, drawing instruments, slide rules, and field equipment. *Frederick Post Co.*



122—Time Saving Tips

Booklet features 59 shortcuts in drafting and computation. Developed through co-operation of leading engineers and draftsmen, text and illustrations deal with such subjects as faster methods for dividing a circle into parts; locating drafting points; determining gear inertia; and interpolating between family of curves. *Frederick Post Co.*



124—Precision Transits

Bulletin 7 includes illustrations, descriptions, and specifications for the Warren-Knight medium size, precision transit. It offers 29 reasons why Warren-Knight instruments are preferred by discriminating engineers. It also gives prices and terms, and offers the instrument on a ten day free trial without expense. *Warren-Knight Co.*

HEAT EXCHANGERS AND WATER HEATERS



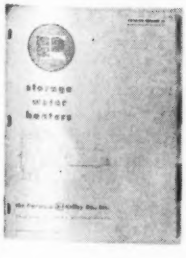
125—Preheater for Small Boilers

The important points to consider in selecting a preheater for use with small boilers (25,000 to 125,000 lbs per hr) are discussed in four-page bulletin on the new package Ljungstrom air preheater. How use of a preheater saves fuel, increases boiler output and reliability, and permits use of lower grade fuels is explained. *Air Preheater Corp.*



128—Heat Exchangers

Bulletin HE-6 is a 28-page pictorial presentation of standard and custom built heat exchangers constructed from steel, non-ferrous materials, or alloys, to meet every temperature, pressure, or vacuum service in conformity to all codes. Features of design and construction are given for each type of heat exchanger. *Henry Vogt Machine Co., Inc.*



126—Storage Water Heaters

"Storage Water Heaters," 48-page catalog 19, gives construction details, storage and heating capacities, dimension tables, and standard specifications for steel, copper-lined, copper silicon, cement-lined, clad-galvanized, and Lo-Flo storage water heaters. Typical piping diagrams are included for easy reference. *Patterson-Kelley Co., Inc.*



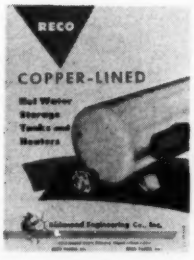
129—Heat Exchangers

Four-page brochure 585 outlines all types of shell and tube CONSECO heat exchanger equipment in all materials, for any pressure and temperature, and for every application. Each type is illustrated and described and special features pointed out. Other products by Condenser are described. *Condenser Service & Engineering Co., Inc.*



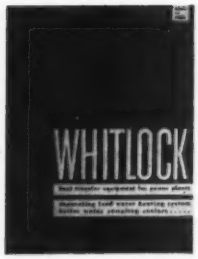
127—High Pressure Closures

Bulletin 5.6K1, four pages, describes high pressure closures for Ross feedwater heaters and other high pressure, high temperature exchangers. Design details are illustrated by photos and cross sections. Text discusses simplicity of design, safety factor, and ease of removal. *Ross Heat Exchanger Div. of American-Standard.*



130—Hot Water Storage

"Reco Copper-Lined Hot Water Storage Tanks and Heaters," four-page folder 513, gives specifications, special construction details, and cutaway drawings of steel-shelled, horizontal and vertical copper-lined tanks and heaters. It discusses briefly the full line of fabricated heat exchange equipment. *Richmond Engineering Co., Inc.*



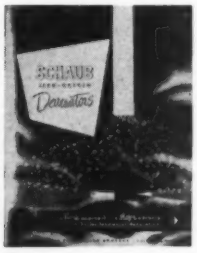
131—Deaerating Systems

Eight-page bulletin 120A describes the need for deaerating feedwater in steam plants and explains the spray and boil-off types of deaerating feedwater heating systems available in economical standard units. Tables are given for determining size of system required and typical installations are shown in flow diagrams. *Whitlock Mfg. Co.*



132—Corrosion Resistant Linings

"Special Corrosion Resistant Linings for Hot Water Storage Tanks and Heaters," four-page folder 514, describes plastic coatings and linings, cement linings, clad steel, and galvanizing for hot water storage tanks and heaters. Suggested uses for each type of lining are listed with advantages. *Richmond Engineering Co., Inc.*



133—Zero-Oxygen Deaerators

Bulletin 575, eight pages, fully describes the new fully vented Schaub Zero-Oxygen Deaerator, which is guaranteed to remove effectively oxygen down to .005 cc per liter. The "whys" and "hows" of deaeration are covered as are the descriptions of all component parts used in conjunction with the system. *Fred H. Schaub Engineering Co.*



134—Deaerating Heaters

Bulletin WC-101B describes the use, advantages, and designs of Graver's spray-type deaerating boiler feedwater heater. Detailed drawings are shown to indicate the operation of the unit in typical applications. Accessories are shown and their uses and advantages discussed for various types of applications. *Graver Water Conditioning Co.*



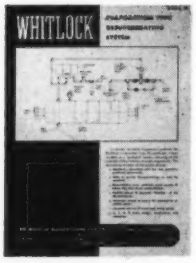
135—Alloy Tubes

Technical manual D-10, 52 pages, on condenser and heat exchanger tubes, gives a brief up-to-date discussion of corrosion problems commonly encountered in various fields. Designed to assist you in the selection of the most satisfactory alloy tube, it provides engineering data useful in specification. *Chase Brass & Copper Co. Inc.*



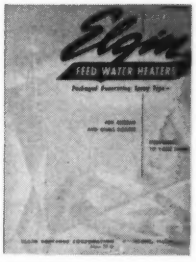
136—Deaerators

Eight-page bulletin 1300 contains all pertinent data on the Schaub ".03" Deaerator, its fully vented design and its completely different principle of operation. Capacities and applications are covered, as well as a complete description of the system itself, including inhibitor and dispersion heater tubes. *Fred H. Schaub Engineering Co.*



137—Desuperheaters

Bulletin 150 explains the advantages of using low pressure, low temperature equipment in high pressure steam generating plants, and describes the evaporative type desuperheater now available as a packaged system. Operating characteristics are given for desuperheaters ranging from 8000 to 150,000 lb per hr steam input. *Whitlock Mfg. Co.*



138—Deaerating Feedwater Heater

Bulletin 614 tells how advantages of five pieces of equipment are incorporated into one compact, efficient product. Elgin uses time proven principles to provide combined feedwater heater, deaerator, make-up storage, make-up control, and condensate storage in one packaged unit, vertical or horizontal type. *Elgin Softener Corp.*

HIGHWAYS, BRIDGES AND STREETS



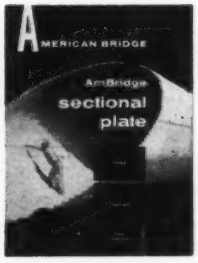
139—Hot-Mix Asphalt Paving

"Mix Design Methods for Hot-Mix Asphalt Paving," 168-page book, outlines in detail four methods: Marshall, Hveem, Hubbard-Field, and Smith Triaxial. It includes general information, preparation of test specimens, test procedures, and interpretation of test data for each. Price, $1.00. You will be billed. *The Asphalt Institute.*



140—Retaining Walls

Sixteen-page manual describes how enbankments can be stablized or confined along highways, railways, city streets, lakes, or streams with Armco Bin-Type Retaining Walls. Less excavation, simple bolted construction, adaptation to curves and changes in elevation are featured. Technical data are given. *Armco Drainage & Metal Products, Inc.*



141—Drainage Structures

"AmBridge Sectional Plate — Pipes, Arches, and Pipe-Arches," 28-page catalog AB10567M, presents complete information on these low cost drainage structures. It covers design, sizes, weights, gages, and assembly instructions. It also gives elevation drawings and layout details. *United States Steel Corp., American Bridge Div.*



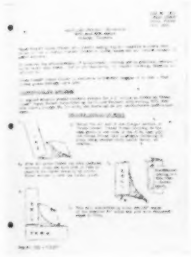
142—Flexible Pavements

"Thickness Design—Flexible Pavements for Streets and Highways," 44-page booklet, outlines alternate designs for each of a variety of traffic and loading conditions. Included are sections on traffic analysis, materials analysis, alternate designs, and economic considerations. Price, 20¢. You will be billed. *The Asphalt Institute.*



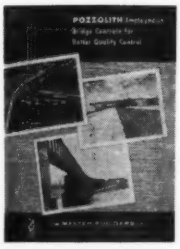
143—Bridge Flooring

Irving decking catalog F-300 contains illustrations, descriptions, and engineering data on open metal grid bridge roadways, with many of the advantages inherent in this type of bridge roadway, such as lightweight, cleanliness, drainage, safety, durability, strength, traction, and economies *Irving Subway Grating Co., Inc.*



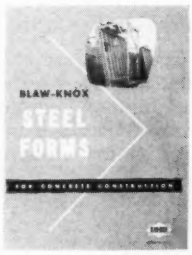
144—Corner Formers

Data sheet details installation method for "Green Streak" corner former which makes it easy to form rounded corners on piers, beams, and many exterior corners where dealing with poured concrete. The corner former is a plastic, reusable concrete form fillet that forms a one-inch radius corner. *Servicised Products Corp.*



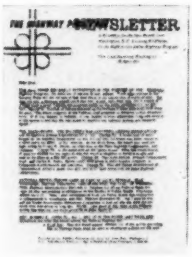
145—Bridge Concreting

Bridge concreting is the theme of this new 16-page *Reporter*. Five case histories covering 280 bridges illustrate problems involved in concreting piers and decks for highway and railway bridges. Discussion covers hot and cold weather concreting; the use of lightweight aggregates; placing and finishing problems. *The Master Builders Co.*



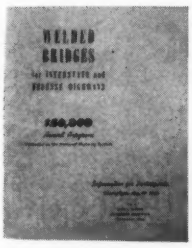
146—Steel Forms

Bulletin 2430 features heavy steel forms for concrete construction. Illustrated are a few of the many major construction projects on which Blaw-Knox heavy forms have been used. Included is important information on all data that should be included with inquiries on steel forms, with practical design suggestions. *Blaw-Knox Co.*



147—Highway Newsletter

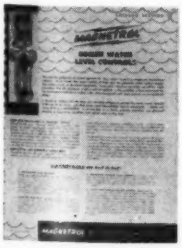
The *Newsletter* is published bi-weekly from Capitol Hill by business writers fully familiar with the new, vast Federal Highway Program. Sample copies sent free to consulting engineers. The Bureau of Public Roads says it must rely on consultants for help on this $52-billion job. Covers business topics, analysis, news. *Highway Publishing Co.*



148—Bridge Design Awards

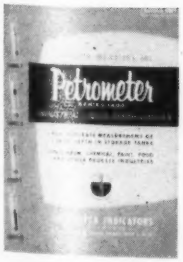
Brochure describes a competition being sponsored by The James F. Lincoln Arc Welding Foundation offering 16 awards for the best designs for welded highway bridges. Top award is $10,000. Any bridge meeting the award specifications, either built, under contract, proposed, or theoretical is eligible. *The James F. Lincoln Arc Welding Foundation.*

INSTRUMENTS AND CONTROLS



149—Boiler Water Level Controls

Four-page catalog section III deals with the use of Magnetrol boiler water level controls for protection of equipment. Single stage, standard multi-stage, and combination water column and level control units are illustrated and described. Construction of each type, its characteristics, and typical applications are discussed. *Magnetrol, Inc.*



150—Industrial Tank Gages

Bulletin 6004 describes a new line of remote reading Industrial Liquid Depth Gauges. It presents comprehensive information on operation and design of the Petrometer Series 1400 Gauges, as well as on the method of selecting the right gage for remote indication of depth or quantity of liquids in tanks and pressure vessels. *Petrometer Corp.*



151—Heating and Cooling Controls

Mercoid automatic controls for heating, refrigeration, air conditioning, and industrial applications are described in 56-page catalog 857. The booklet is completely indexed by subject and catalog number and gives all pertinent engineering data, specifications, dimensions, ranges, and temperature and pressure charts. *The Mercoid Corp.*



152—Density Tester

Bulletin CN-980 contains complete information on the new Volumeasure, a self-contained, lightweight, and accurate unit designed for fast and simple field or laboratory in-place density tests of soils. The unit provides a positive test method for use in embankment control and subgrade compaction projects. *Soiltest, Inc.*



153—Liquid Level Controls

Catalog section I describes the foolproof switch mechanism operation of Magnetrol liquid level controls. It covers operation and construction of ten representative types of controls for almost any liquid, at any pressure and temperature. The units are available for electric or pneumatic operation. *Magnetrol, Inc.*



154—Specific Gravity Indicator

Four-page technical bulletin 7004 describes the operation, design, and construction of the new remote reading Specific Gravity Indicator 1561, an automatic, direct reading, non-mechanical instrument, accurate to 0.001 unit of specific gravity. Easy installation and maintenance features are illustrated and discussed. *Petrometer Corp.*



155—Remote Reading Gages

Jerguson inclined Truscale remote reading gages, designed for use where gages must be mounted high or low on the instrument panel, are described in data sheet No. 291. For high installation the case is built so that the cover and scale incline downward; for low installation, so that they incline upward. *Jerguson Gage & Valve Co.*



156—Compression Tester

Bulletin AP-350 illustrates and describes the Versa-Tester, a multi-purpose compression testing machine ideal for research or routine laboratory testing. Accurate tests requiring capacities to 30,000 lb can be performed simply and quickly on soils, bituminous materials, mortar, concrete, plastics, metals, and wood. *Soiltest, Inc.*



157—Liquid-Level Alarms

A series of four Levalarms, liquid level alarms and fuel cut-outs, is described in four-page bulletin D2. The bulletin explains principle of operation — water conduction between electrodes of varying lengths—how the units can be used with relays to provide alarm actuation, fuel cut-out, or pump start-stop control. *The Reliance Gauge Column Co.*



158—Water Level Recorders

Bulletin 24 describes Stevens Type F, an inexpensive yet sensitive, portable recorder for automatic graphic recording of flow over Parshall flumes, levels in reservoirs or levels in observation wells. A wide variety of time scales and gage scales is offered and the instrument has unlimited recording range. *Leupold & Stevens Instruments, Inc.*



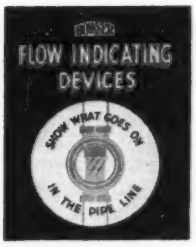
159—Liquid Level Indicators

How the Eye-Hye gage helps protect the power plant from liquid level accidents is explained in four-page catalog 500, Sec. CO. A diagram shows the flexibility of placement possible: near boiler, tank, or other vessel, or on instrument panelboard, near by or considerably removed from the boiler. *The Reliance Gauge Column Co.*



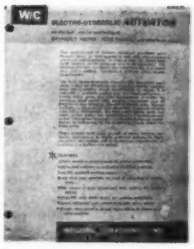
160—Small Case Instruments

Catalog 51-1450 describes low-cost, 9¼-x 10⅞-in. instruments for indicating, transmitting, and controlling temperatures from –400 to 1000 F and pressures from 30-in. Hg vacuum to 5000 psi. Cases of glass fiber are chemical, corrosion, electrical, and flame resistant; and possess high impact strength. *Fischer & Porter Co.*



161—Flow Indicators

Bowser flow indicating devices for many industrial in-plant or process systems are illustrated in a broad size range with complete data, including specifications and dimensions for easy reference. Each product is pictured and described with suggested commercial and industrial applications, sizes, and types listed. *Bowser, Inc.*



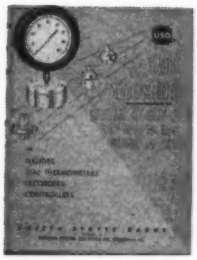
162—Actuators

Bulletin 22 describes a positional control for actuation of butterfly valves, control valves, and dampers. The actuator utilizes the electrical input signal from standard controllers and has linear stroke to 100,000 ft lb, full stroke in 1 sec, frequency response flat to 5 cps. Complete specifications are given. *Weighing Components, Inc.*



163—Valve Controls

"Limitorque Control," 30-page catalog L-550, gives background information on this automatic, power activated device for controlling all types of valves and sluice gates. It describes the available types and lists specific applications. Installations are shown in power plants, refineries, and in various industries. *Philadelphia Gear Works, Inc.*



164—Instrument Accessories

Bulletin 600 describes accessories for various types of gages, dial thermometers, and recorders, including attachments for protection of instrument internals against corrosive media and pulsations in pressures. It also shows ring for panel mounting of turret case instruments. *U.S. Gauge Div. of American Machine and Metals, Inc.*



165—Water Level Recorders

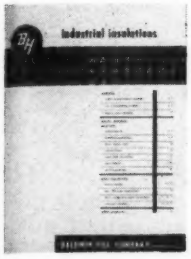
Bulletin 12 contains information on the new Stevens surface detector, a water level recorder that eliminates the necessity of large, costly stilling wells in accurate water level measurement and recording. The unit requires only a three-inch pipe and is dry cell battery operated. Operation is discussed. *Leupold & Stevens Instruments, Inc.*



166—Test Gage Catalog

Eight-page bulletin 400 deals with selection of test gages for fluid pressure measurement in laboratories, production testing, field inspections, test stands, and recalibration benches. It provides a list of check points for ordering gages, and suggests applications for each. *U. S. Gauge Div. of American Machine and Metals, Inc.*

INSULATION



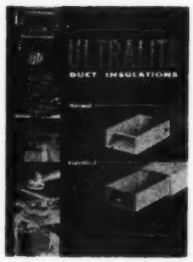
167—Industrial Insulations

Baldwin-Hill products for industrial insulation: cements; blocks, blankets, and felts; pipe insulations; and duct and special insulation products are described in this 20-page bulletin. Recommended thicknesses and thermal conductivity charts are included, along with photographs and drawings of typical applications. *Baldwin-Hill Co.*



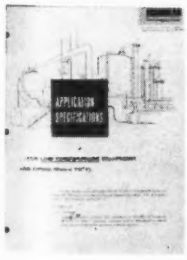
168—Underground Pipe Insulation

Four-page illustrated brochure discusses the problems of underground pipe insulation and explains how Gilsulate's special properties overcome them. On-the-job photos illustrate ease and speed of application. Thermal coefficients of transmission and other technical data and specifications are given. *American Gilsonite Co.*



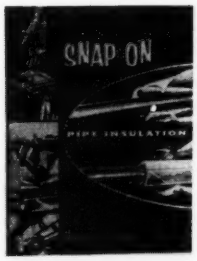
169—Duct Insulations

"Ultralite Duct Insulations," eight-page bulletin, describes thermal and acoustical properties of Ultralite glass fiber duct insulations. Application data cover: wrap-on thermal insulation of heating, cooling, combination, and ventilating duct, with surface finishes listed. Sound absorption coefficient charts are given. *Gustin-Bacon Mfg. Co.*



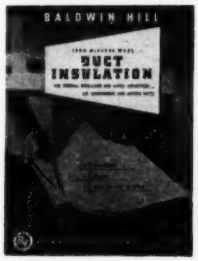
170—Foamglas Insulation

This set of six booklets covers the application of Foamglas insulation for use on low, medium, and high temperature industrial equipment and piping. Each booklet contains tables of suggested thicknesses of insulation to be applied, detail drawings of installation procedure, and insulation supports. *Pittsburgh Corning Corp.*



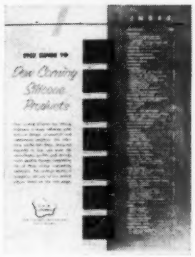
171—Pipe Insulation

"Snap*On Pipe Insulation," eight-page booklet, describes characteristics and application data for one piece, fine-glass pipe insulation. Application specifications cover: plumbing, heating, insulation of valves and fittings, cold piping, and dual temperature outdoor piping. Charts show recommended thicknesses. *Gustin-Bacon Mfg. Co.*



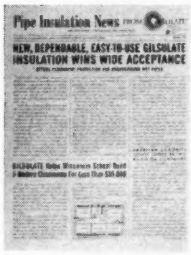
172—Mineral Wool Insulation

Spun mineral wool duct insulation for thermal insulation and sound absorption for air conditioning and heating ducts is presented in four-page folder E-229-56. Thermal efficiency, sound absorption, maximum temperatures, density, moisture resistance, and workability are discussed, along with various methods of application. *Baldwin-Hill Co.*



173—Guide to Silicone Products

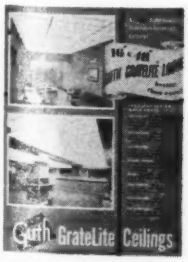
Brochure 1-112 details more than fifty different uses for silicone products. Basic properties of various silicone materials, their application and the benefits obtained by specifying original equipment using silicones are described. Topics include silicone insulated motors and transformers and silicone protective coatings. *Dow Corning Corp.*



174—Pipe Insulation News

"Pipe Insulation News" is a new external house organ published quarterly by the manufacturer of Gilsulate insulation for underground hot pipes. It carries stories and articles dealing with problems of insulating these pipes. This issue (Winter 1957) illustrates use of the material at the New York International Airport. *American Gilsonite Co.*

LIGHTING



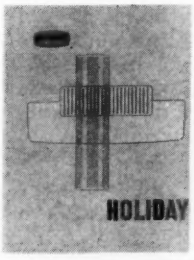
175—Over-all Ceiling Lighting

This packet of two and four page brochures features the Gratelite Louver Diffuser for over-all ceiling lighting. It includes full installation, performance, and construction data; description of the new Una-Tee suspension system; time-saving estimating tables; and Gratelite ceiling layout information. *Edwin F. Guth Co.*



176—Ballast Protection

This four-page bulletin explains the protective advantages of fluorescent lamp ballasts with Advan-Guard. These ballasts have a built-in thermally actuated protective device that eliminates over-heating — the most common cause of shortened ballast life. Advan-Guard is sensitive to temperature, voltage, and current. *Advance Transformer Co.*



177—Rapid-Start Light Fixtures

Folder OD-660 features the Holiday, a recently introduced two-lamp rapid-start fixture for offices, libraries, stores, and other commercial type locations. It contains illustrations, application drawings, explanatory text, and lists features of the fixture. Light distribution pattern and coefficients of utilization are given. *Day-Brite Lighting, Inc.*



178—Lighting Fixtures

Eight-page bulletin 976 describes the new Guth Futurliter fixture that features a "flexible foot-candle package." It includes pictures, light curves, coefficients of utilization, descriptive data, and installation information, either pendant or close-ceiling types, on the complete line. Micro-Hangers are also listed and described. *Edwin F. Guth Co.*



179—RLM Specifications

This new edition of the "RLM Standard Specifications for Industrial Lighting Units" includes newly revised light distribution curves on RLM direct and semi-direct fluorescent lighting units. Most important changes and additions are new coefficient of utilization tables for eight incandescent and fluorescent units. *RLM Standards Institute.*



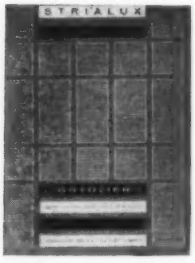
180—Recessed Dome Lighting

Eight-page Quadrilite brochure describes a new concept in recesssed dome incandescent lighting. It shows how diffused wide-area illumination is combined with specific downlight, details design features of units 2- x 2-ft square and 34 inches in diameter, and illustrates how they fit modern ceiling systems. *Lightolier, Inc.*



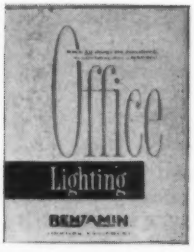
181—Incandescent Reflectors

Standard dome, shallow dome, deep bowl, rectangular angle, and symmetrical angle incandescent reflectors finished in all white porcelain with apertured neck or solid neck reflectors finished green outside, white inside, are described in this data sheet. It gives coefficient of utilization tables and recommended spacing. *Electro Silv-A-King Corp.*



182—Recessed Lighting

New 24-page Strialux brochure details latest in recessed fluorescent lighting. It shows how 2- x 2-ft and 2- x 4-ft modular units of Strialux fit the new suspended ceiling systems, and describes all design features. Detail drawings of new ceiling construction, lighting data, dimensions, and specifications are included. *Lightolier, Inc.*



183—Office Lighting

Four-page bulletin shows how better lighting cuts office operating costs by improving worker efficiency, reducing absences, and making better use of space. Reference chart points out things to consider in terms of light levels, visual comfort, and maintenance. Booklet also shows full line of office lighting units. *Benjamin Electric Mfg. Co.*



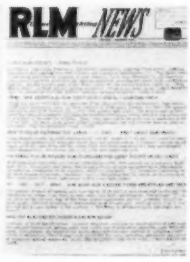
184—All Steel Light Fixture

The Smithcraft "Executive," a very wide, shallow, all steel louvered fluorescent fixture with self-illuminated sides, in 4- and 8-ft lengths for two or four Rapid-Start or Slimline lamps, is introduced in bulletin 1500. Photometric data, specifications, lighting characteristics, mountings, and accessories are included. *Smithcraft Lighting.*



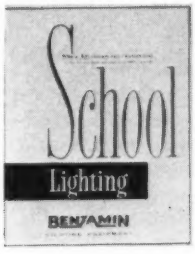
185—Extra Shallow Fixtures

The consulting engineer can give his client 16 sq ft of efficient lighting with one 8-ft, 24-in. wide Surf-A-Lite. ETL reports, coefficients of utilization, dimensional and installation details and specification data are given on the 12-, 17-, and 24-in. wide, 2 and 4 lamp series in illustrated bulletin COM 201-A. *Electro Silv-A-King Corp.*



186—Lighting Newsletter

A new RLM service for those interested in industrial lighting is publication of a news letter covering developments in standards, new specifications, and progress reports. Vol. 1, No. 1 covers forthcoming RLM specification for fluorescent units for 800 milliamp lamps and data on efficiency of SD-1 units. *RLM Standards Institute.*



187—School Lighting

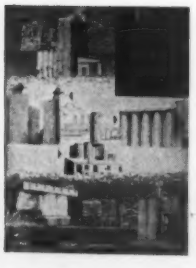
Four-page illustrated bulletin contains actual experiences that point out how better school lighting improves learning, reduces fatigue, encourages safety, and protects students' vision. It contains reference guide for selecting school lighting units and shows complete line of school lighting units. *Benjamin Electric Mfg. Co.*



188—Aluminum Framed Luminaire

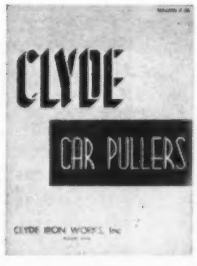
The Smithcraft "Civic," an extruded aluminum framed luminaire to complement the beauty of any interior, for two or four Rapid-Start Bi-Pin lamps, with either Corning Pattern # 70 glass or with acrylic plastic, is described in bulletin 1501. Photometric data, specifications and lighting characteristics are included. *Smithcraft Lighting*

MATERIALS HANDLING AND STORAGE



189—Industrial Storage Silos

"Modern Industrial Storage Systems," 12-page brochure 4393, discusses the subject of storage for raw ingredients, semi-processed, or finished materials. The flexibility and adaptability of concrete silos is discussed. Descriptions of component parts and construction are supplemented with line drawings. *The Marietta Concrete Corp.*



190—Car Pullers

Ten-page bulletin L-6 shows capstan type car puller for moving cars a short distance using manila rope. Three styles of drum car pullers for heavy duty car moving, shuttle work, or for servicing very large areas are also listed, as well as barge movers for shifting barges back and forth during unloading. *Clyde Iron Works, Inc.*



191—Electric Hoists

Featured in four-page bulletin H-44 is the complete line of P & H electric hoists, including condensed specifications and specially prepared cutaway photos of the complete Hevi-Lift and Zip-Lift Hoist Line. The new P & H control cabinet, redesigned to better meet users' needs, is described in detail. *Harnischfeger Corp.*



192—Steel Derricks

Advantages gained by using Whirlettes — full revolving, self contained steel derricks — are listed in four-page folder MP-49. The hoist is mounted on the rotating structure and only one foundation is necessary. No guy lines or stiff legs are required. Booklet gives specifications, and illustrates typical uses. *Clyde Iron Works, Inc.*



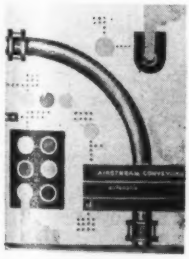
193—Stepless Crane Control

Principles of operation of the new P & H electronic stepless control for overhead traveling cranes are discussed in four-page bulletin C-53. Applied in conjunction with the standard P & H Magnetorque, this control is said to provide an ultimate in control and precision spotting in both lowering and hoisting. *Harnischfeger Corp.*



194—Sand and Gravel Jigs

Bulletin 892 features a low cost method of removing foreign materials from sand and gravel with the Jeffrey heavy duty jig which can also be used in concentration of ores. Capacities up to 75 tons per hour. Specifications, diagrams with dimensions, illustrations, and operation data are included for the units. *The Jeffrey Mfg. Co.*



195—Airstream Conveyors

New 32-page bulletin 530, "Airstream Conveyors — the automatic answer to modern bulk handling," contains new data and over 70 illustrations and diagrams explaining operation, applications, and advantages of air conveying. Practical solutions to various types of handling problems, including automated systems, are given. *Dracco Corp.*



196—Materials Handling Equipment

Bulletin 241, "Working for Profit in Every Industry," describes and illustrates the application of Whiting materials handling, foundry, railroad, and chemical processing equipment in metalworking, processing, transportation, and utilities industries. A 32-page pocket size edition includes a reply card. *Whiting Corp.*



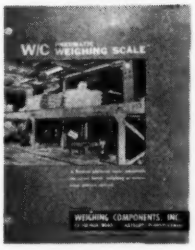
197—Materials Handling Equipment

Bulletin G-3, "Fuller Equipment For The Process Industries," describes Fuller rotary compressors and vacuum pumps; inclined-grate material coolers; Fuller preheater, Humboldt suspension type; Fuller-Kinyon, Airveyor, and F-H Airslide conveying systems for handling dry, pulverized, granular, and crushed materials. *Fuller Co.*



198—Tubular Conveyors

This new catalog presents numerous examples of the use of Hapman Tubular Conveyors in all types of industries for moving flowable materials — wet and dry — through any plane or angle. Weight-volume-time conversion chart, conveyor capacity chart, suggested applications, and specifications are given. *Hapman Conveyors, Inc.*



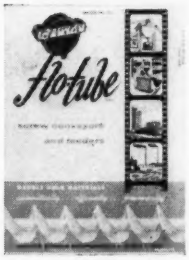
199—Weighing Scales

"W/C Pneumatic Weighing Scale," four-page folder 10, describes a new platform weighing scale adaptable for batch or continuous process control, with scale indication errors never greater than 0.25 percent of range. Bulletin covers outstanding features, typical applications, accessories, capacities, and sizes. *Weighing Components, Inc.*



200—Pneumatic Conveyors

The Hoffco-veyor Systems for pneumatic conveying of dry, free flowing materials are described in eight-page booklet PN-500. It details reasons for installing such a system, basic types available, discusses successful installations in operation, and gives a run down on details of installation and uses. *U. S. Hoffman Machinery Corp.*



201—Screw Conveyors

Bulletin 957 presents Flo-tubes for moving or feeding such materials as coal, sand, gravel, sawdust, salts, sugars, wood-chips, and chemicals at controlled rates from bins or piles. With automatic controls, Flo-tubes save up to 95 percent in time on general applications, up to 90 percent for moving coal to boilers. *Canton Stoker Corp.*



202—Overhead Handling Systems

Bulletin M-32, "Ideas in Materials Handling," describes how the Whiting Trambeam overhead handling system takes materials from point to point faster and easier, saving time and money with every move. The 12-page booklet includes application drawings for production, shipping, receiving, warehousing, storage. *Whiting Corp.*

To order personal copies of these bulletins, please fill out the card between pages 2 and 3 or 34 and 35.



203—Storage Bins

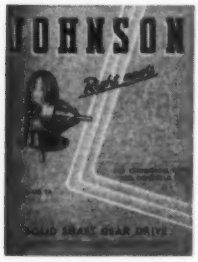
This four-page bulletin describes and illustrates construction of Neff & Fry's Super-Concrete Stave storage bins for industry. Lists of prominent users and varieties of materials are given, as well as tables of capacities in relation to bin diameters, heights, and weights of materials. Concrete roofs are discussed. *Neff & Fry Co.*

MECHANICAL POWER TRANSMISSION



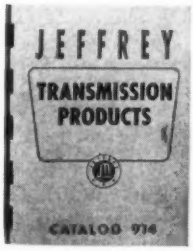
204—Speed Reducers

"Philadelphia Herringbone Reducers," catalog H-55, 48 pages, gives full details regarding the entire line of Herringbone units: horsepower ratings, capacities, dimensions, parts lists, load capacities, torque ratings, and installation diagrams. These units are available in single, double, and triple reductions. *Philadelphia Gear Works, Inc.*



205—Right Angle Gear Drives

Right angle solid shaft gear drives, for centrifugal pumps and industrial use — cooling tower installations, barge service, sewage disposal, fire and flood control — manufactured in a wide range of models to meet specific requirements, are described and illustrated with engineering details in eight-page catalog 28. *Johnson Gear & Mfg. Co.*



206—Transmission Products

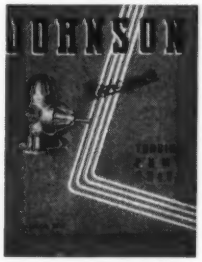
Catalog 914 describes various transmission products used on elevating and conveying machinery and in other industrial machinery fields. 88 pages with diagrams, specifications, illustrations, operation data, and description cover different chains and drives, take-ups, gears, shafts, set collars, pillow blocks, and clutches. *The Jeffrey Mfg. Co.*



207—Fluid Drives

Bulletin 9717 describes the new size 126 Type T Gyrol fluid drive for general industrial application. It discusses construction features of the improved design and outlines its advantages in typical industrial installations. Photographs show the basic unit for use with engine drives and modified arrangement. *American Blower Corp.*

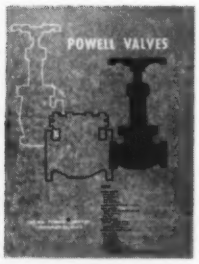
To order personal copies of these bulletins, please fill out the card between pages 2 and 3 or 34 and 35.



208—Turbine Pump Drives

Right angle turbine pump drives, in standard and combination drive installations and available in a wide range of models to meet specific requirements of high or slow speed prime movers and pumps, are described and illustrated in nine-page catalog 27. Tables and charts show power ratings and average efficiencies. *Johnson Gear & Mfg. Co.*

PIPING, VALVES, AND PLUMBING



209—Valves

This 24-page catalog describes and illustrates Powell bronze, iron, steel, and corrosion resistant valves, and engineering specialties such as liquid level gages, lubricators, cocks, blow gun and air valves, whistles, and whistle valves. Engineering information included makes this a "must" for your library. *The William Powell Co.*



212—Stainless Steel Fittings

This 22-page catalog explains how Speedline stainless steel fittings reduce piping costs by allowing the designer to take advantage of the new and more economical Schedules 5 and 10 stainless steel pipe. A schematic drawing illustrates use of these fittings for a wide range of industrial applications. *Horace T. Potts Co.*



210—Power and Process Piping

"Harnessing the Energy of Steam" describes research, metallurgy, engineering, fabrication, and erection of high temperature, high pressure ferritic and austenitic alloy piping for central station, industrial, nuclear energy, and processing plants. Quality control and test methods are given. *Pittsburgh Piping and Equipment Co.*



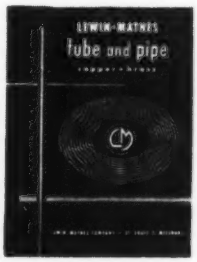
213—Underground Piping

Bulletin SW-1156-55 describes the One-Over-One Cert-A-Bar Conduit System — a new development in underground piping layouts for steam and condensate systems and high temperature water systems. Easier installation, smaller and fewer manholes, and elimination of pipe crowding are discussed. *Stillwater Clay Products Co., Conduit Div.*



211—Pipe Protection

"Where to Use Tapecoat," eight-page bulletin, presents applications and data on Tapecoat coal tar coating in tape form for double-wrapping on pipe, pipe joints, mechanical couplings, conduit, cable and insulated piping, above and below ground. It includes table of coverage for various sizes and presents case histories. *The Tapecoat Co.*



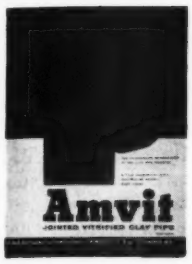
214—Tubing and Piping

This 12-page bulletin lists each type of Lewin-Mathes copper and brass tubing and piping with the temper, lengths, fittings, uses, and specifications. Sizes and capacities are in table form to aid in selection. Photos show use for water piping, air conditioning, heating, underground service and drainage lines. *Lewin-Mathes Co.*



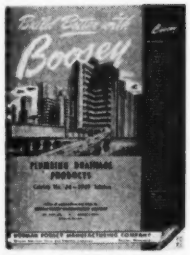
215—Valve Manual

Forty-page catalog B-2 is designed to help engineers select valve types, understand their characteristics, and determine space requirements. It includes such useful data as: pressure drop and flow tables, conversion tables, theory and application, recommended materials, and describes Pratt valves and operators. *The Henry Pratt Co.*



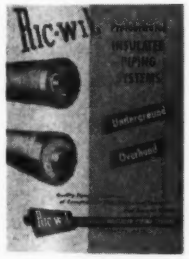
216—Jointed Clay Pipe

Jointed vitrified clay pipe known as Amvit, with a built-in mechanical joint made from polyvinyl chloride is described in four-page folder. Advantages such as infiltration prevention, quick installation, immediate backfilling, better flow, shock absorption, and quick testing in the field are pointed out. *American Vitrified Products Co.*



217—Plumbing Drainage Products

Catalog 34, "Build Better with Boosey," gives specifications, dimensions, suggested applications, drawings, and engineering data on a complete line of plumbing drainage products. It covers back water control valves, grease interceptors, floor and shower drains, roof drains, vacuum breakers and fixed air gaps. *Norman Boosey Mfg. Co.*



218—Insulated Piping Systems

"Prefabricated Insulated Piping Systems," new 20-page bulletin 57-1, shows typical uses for Hel-cor pipe units for underground or overhead piping systems, and for Utilidor conduits for protection of underground utility services. Sample specifications are given, along with conduit sizing charts and trenching dimensions. *Ric-wiL, Inc.*



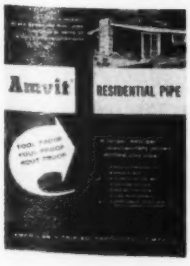
219—Lagging Adhesives

Swift's lagging adhesives for heating and process piping, and the 12 important advantages that they offer, are described in four-page folder 9283. They are recommended for bonding shells of molded insulation to themselves or pipes; as binder for loose insulation; and to adhere and size lagging cloth. *Swift & Co., Adhesives Products Dept.*



220—Fire Hose Stations

This four-page bulletin presents a new built-in and wall-mounted fire hose station for offices, farm buildings, factories, and other commercial and industrial buildings. It is completely illustrated and includes specifications, suggested locations, and dimensions. A separate price list is included with booklet. *W. D. Allen Mfg. Co.*



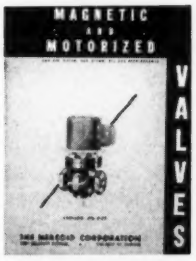
221—Vitrified Clay Pipe

Mechanically jointed vitrified clay pipe that speeds installation, saves labor, permits deflection, absorbs shocks, permits better flow, requires less maintenance, and is approved by state health and plumbing departments for small capacity jobs is described in six-page folder. Factors affecting pipe are discussed. *American Vitrified Products Co.*



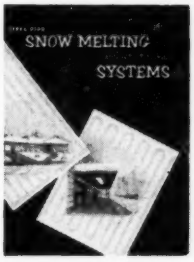
222—Drains

This six-page "Selection Reference Guide" contains brief suggested specifications for use in setting up standard consulting engineers' specifications. It gives complete information on what Boosey drain to select for each location. Data is taken from recent installations in which these products were used. *Norman Boosey Mfg. Co.*



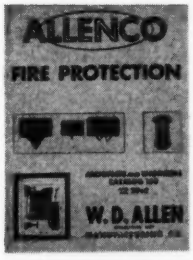
223—Valves

Twenty-page catalog V-55 covers magnetic and motorized valves for air, water, gas, steam, oil, and refrigerants. It includes specifications, sizes, capacities, and suggested applications for each type of valve, flow charts for liquids and compressible fluids, tables of dimensions, and other engineering data. *The Mercoid Corp.*



224—Snow Melting Systems

"Steel Pipe Snow Melting and Ice Removal Systems," 32 pages, presents the case for snow melting systems and shows typical installations in commercial and industrial locations. Design data is complete with information on anti-freeze mixtures, sizes, and spacing. *Committee on Steel Pipe Research, American Iron and Steel Institute.*



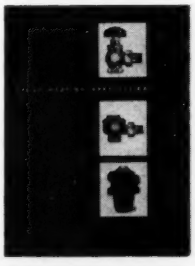
225—Fire Protection Equipment

Catalog 150, 42 pages, covers the complete Allenco line of fire protection equipment: fire hoses, fire hose racks and reels; fire extinguishers; built-in and wall mounted cabinets for the above equipment; standpipe and wall hydrant connections and nozzles. Installation specifications are given for each item. *W. D. Allen Mfg. Co.*



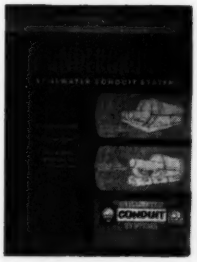
226—Hard Rubber Fittings

Buna-N hard rubber products — their resistance to heat and oil, physical properties, and resistance to various types of chemicals — are described in four-page folder E-212. It gives data on plug cocks, tees, couplings, pipe caps and plugs, unions, straightway cocks, ells, crosses, reducing bushings, and flanges. *Luzerne Rubber Co.*



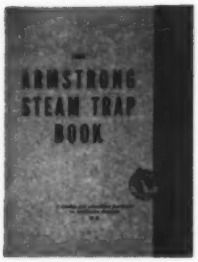
227—Steam Heating Specialties

Illinois steam heating specialties — packless radiator valves, thermostatic and float traps, vapor systems, and boiler room specialties — are described in eight-page bulletin 201. Cross sections, elevation drawings, specifications, and a description of component parts are included for each item in the line. *Illinois Engineering Co.*



228—Conduit Systems

"Go Underground with Stillwater Conduit Systems," four-page illustrated brochure, describes tunnel and round ceramic conduit systems. It points up advantages of Stillwater Conduit Systems — permanence, protection, adaptability, ease of installation, and efficiency — in service piping. *Stillwater Clay Products Co., Conduit Div.*



229—Steam Trap Manual

"The Armstrong Steam Trap Book, 2nd Edition," 46-page catalog J, explains the benefits of good trapping and how you can obtain them. A handbook section provides capacity charts and other data necessary to the correct trapping of all major classes of steam-heated equipment. Manual is completely indexed. *Armstrong Machine Works.*



230—Pipe Vibration

The plague of oscillation set up in pipe lines during pumping of compressible gases is costing industry millions of dollars yearly through inefficiency and pipe systems maintenance, according to booklet, "Bouncing Pipes," which deals in detail with the cause, effect, and remedy of this engineering problem. *Burgess-Manning Co., Snubber Div.*



231—Bronze Globe Valves

Four-page circular 602-2 describes the two pressure classes of LQ600 Bronze Glove Valves with patented Brinalloy seats and discs. It details features and sizes of the original Fig. LQ600-150 valve, rated at 150 lb sp, 30 lb wog; and the new Fig. LQ600-200 valve, rated at 200 lb sp, 550 F, 400 lb wog. *The Lunkenheimer Co.*



232—Pressure Regulating Valves

Bulletin 301 provides information on the Clark Type "CRV" Pressure Regulator. Suitable for steam and non-toxic, non-flammable gas, these pressure regulators are suitable for operation at initial pressures and temperatures up to 250 psi and 450 F. Design features, operation, and proper sizing are shown with specifications. *The Clark Mfg. Co.*



233—Welded Stainless Piping

"The Plastic Ductility of Austenitic Piping Containing Welded Joints at 1200 F" is a report of an investigation into the problem of selection of materials for main steam piping. It gives data on the stress rupture characteristics of Types 316 and 347 stainless steel piping adjacent to welded joints. *Pittsburgh Piping and Equipment Co.*



234—Diaphragm Valves

Bulletin 104 describes the exclusive features of Hills-McCanna diaphragm valves for positive closure, and the latest in plastic valves and diaphragms for corrosive services. Charts for diaphragm material selection and dimensional specifications are also given, along with a list of advantages and applications. *Hills-McCanna Co.*



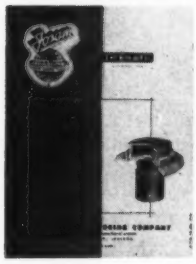
235—Industrial Eye-Wash Units

Four page folder EW-3 covers emergency eye-wash fountains for industrial eye safety. Controlled streams flush away dangerous matter instantly. It deals also with drench showers for contaminated clothes and bodies and gives details of many models for all industrial applications including "freeze-proof" models. *Haws Drinking Faucet Co.*



236—Gate Valves

Bulletin 1007, four pages, describes and illustrates the versatility of the OIC Duo-Bolt Gate Line Valves in the IBBM and all iron series. The IBBM series features bronze seat rings that are cast and rolled into position. The all iron series features nickel plated steel stems and rugged resistant type body bonnet. *The Ohio Injector Co.*



237—Cleanouts and Covers

"Superseal Cleanouts and Access Covers," 18-page catalog CL, gives typical installation methods, dimensions, installation diagrams, and suggested locations. Each item is illustrated and described and specifications are given. Materials and finishes available are listed and typical code requirements are discussed. *Josam Mfg. Co.*



238—Multiple Fountains

This colorful four-page brochure explains the design, construction, and gives specifications of Haws wall-hung multiple fountains now available in permanently colored Fiberglas. Color samples are included. Haws "vandal-proof" features are explained. Detailed specification drawings show design and installation. *Haws Drinking Faucet Co.*



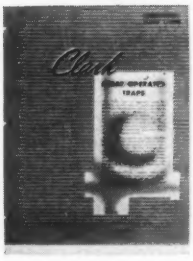
239—Pressure Liquid Strainers

Bulletin 6 deals with strainers for all types of liquids, gas, or steam using 8 through 150 mesh strainer cylinder. Single or duplex with switching valve, in ten sizes, capacities per single strainer are from 1 to 7500 gpm at 6 psi differential pressure depending upon the viscosity of liquid being processed. *Wm. W. Nugent & Co., Inc.*



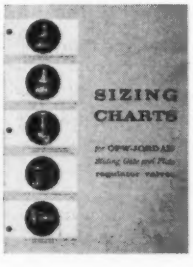
240—Pilot Operated Valves

Unique sliding gate seating design and exclusive features of valve are described in bulletin J-1160. Text explains how metallic diaphragm, metal to metal seals, straight-through body, and durable construction assure precise regulation with immediate response. Tables list steam, water, air capacities, and dimensions. *Jordan Corp.*



241—Float Operated Traps

Bulletin 410 offers complete information on Clark float traps. Illustrations feature and explain the Duo-Step leverage principle. Brochure shows why these traps have greater capacities and cost less to operate. Specifications, descriptions, and diagrams are included for dual gravity, constant level, and continuous drainage. *The Clark Mfg. Co.*



242—Sizing Chart

OPW-Jordan six-page Bulletin J-SC contains complete sliding gate and plate valve capacity data for saturated steam, water, other liquids, and air and gases. It also details much valuable general information about sizing formulas, correction for viscosity, superheat, specific gravity, and other pertinent engineering facts. *Jordan Corp.*



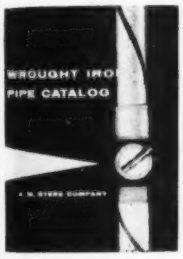
243—Solenoid Valves

This new solenoid valve catalog provides complete information on the comprehensive line of ASCO solenoid valves. Listed are 2-, 3-, and 4-way valves for standard duty or for special applications (corrosion resistant, sanitary, bulk loading, and steam). An illustrated engineering section includes flow diagrams. *Automatic Switch Co.*



244—Scale-Free Couplings

Bulletin 373 describes Tube-Turn SF welding couplings that eliminate weiding scale, icicles, or other protrusions that damage pumps and valves, and cause pressure losses. Specifications are given for sizes ½ thru 12 in. Welding and installation procedures are explained with step-by-step illustrations. *Tube Turns, Inc.*



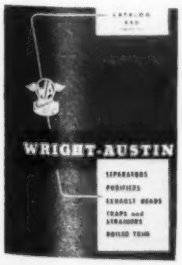
245—Wrought Iron Pipe

This 48-page catalog covers the complete line of wrought iron pipe and tubular products. It gives physical properties, specifications, and drawings for each type of product and suggests possible uses. A complete index, installation photos, and conversion tables make this handy reference material for your files. *A. M. Byers Co.*



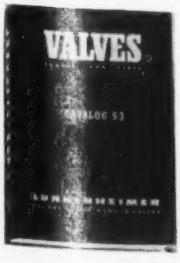
246—Lubricated Plug Valves

Catalog 400 gives complete data on ACF full-pipe area, cylindrical plug construction, lubricated plug valves, ½ through 30 inches, 175 through 500 lbs. wog, made in semi-steel, carbon steel, bronze, and aluminum for complete range of fluid handling requirements. Data on accessories is included. *W-K-M, a division of ACF Industries, Inc.*



247—Separators and Purifiers

New 32-page catalog 450 illustrates and describes the most modern equipment used for steam, compressed air, and gas applications. This edition includes typical installations, technical data, selection charts, and general information on the complete line of separators, purifiers, exhaust heads, traps, strainers, and boiler trim. *Wright-Austin Co.*



248—Valves and Fittings

Steel, iron, and bronze valves, as well as lubricating devices, boiler mountings, cocks, and other products, are described in 506-page catalog 53. Over 100 pages of reference data are provided. Thumb-indexed selector guide groups valves according to pressure classifications for easy reference and usage. *The Lunkenheimer Co.*



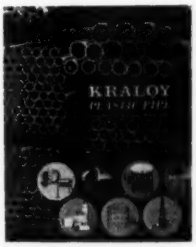
249—Spray Nozzles

Bulletin N-618, 24 pages, gives useful information on the complete Yarway line of spray nozzles for cooling ponds and for wide industrial use. Included is installation data, capacities, and dimensions for Yarway involute nozzles, fan-spray nozzles, and fittings for cooling ponds. Also articles on spray re-cooling of water. *Yarnall-Waring Co.*



250—Coal-Tar Tape

This new folder discusses Tapecoat coal-tar coatings in tape form, listing all Tapecoat products for preventive maintenance service on pipe, pipe joints, fittings, couplings, tanks, cable, and conduit. It includes a handy built-in reply card to secure specific data on your client's particular corrosion problem. *Tapecoat Co.*



251—Plastic Pipe

These separate application folders in a loose-leaf cover describe use of and specifications for plastic pipe and tubing in: public water works; gas industry and utilities; petroleum industry; and agricultural and turf irrigation. Brochures deal principally with rigid high-impact polyvinyl plastic pipe and fittings. *Kraloy Plastic Pipe Co., Inc.*



252—Stainless Steel Fittings

Complete dimensional data for the full line of Tube-Turn stainless steel welding fittings and flanges are listed in this 56-page catalog. Technical section (14 pages) gives allowable working pressures, corrosion resistance, fitting tolerances, and allowable S values for stainless steel. Welding instructions also included. *Tube Turns, Inc.*



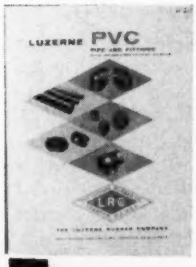
253—Steam Condensate Lines

This technical bulletin, "Use of Wrought Iron Pipe for Steam Condensate Lines," discusses, in detail, corrosion factors and effects common to steam condensate installations. Offers preventive measures for minimizing corrosion and lists maintenance tips on design and installation. Includes reports of wrought iron in this service. *A. M. Byers Co.*



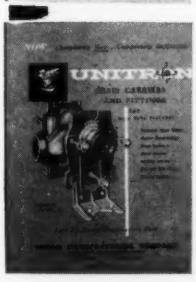
254—Alloy Steel Welding-Fittings

Bulletin illustrates all shapes, sizes, and schedules in low and intermediate alloys and stainless steels of Key-Kast welding fittings for piping systems. Fittings meet ASME, ASTM, and ASA codes and are produced with rigid quality control including hydrostatic testing before shipment. *W-K-M, a division of ACF Industries, Inc.*



255—PVC Pipe and Fittings

Luzerne PVC pipe and fittings (rigid, unplasticized polyvinyl chloride) are described in eight-page bulletin PF 1200. Physical properties — mechanical, electrical, thermal, and miscellaneous — are given for straight PVC and for modified PVC, as well as chemical resistance tables, weights, and dimensions. *The Luzerne Rubber Co.*



256—Plumbing Fixtures

Unitron chair carriers and fittings for wall hung fixtures, such as horizontal and vertical closet fittings, lavatory, sink, and slab carriers, and hospital carriers are described and illustrated in manual FB. General specifications, special features, and drawing of each part of the carrier or fitting are included. *Josam Mfg. Co.*



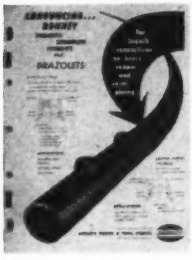
257—LP Gas Valves

"Valves for Safe, Positive Control of LP Gas," bulletin 1002-R, presents an entirely new product line made available to consulting engineers who recognize the superiority of welded joints for leakproof piping in LP gas services. Rugged forged and cast steel globes, angles, and checks offer soft Hycar synthetic discs. *Ohio Injector Co.*



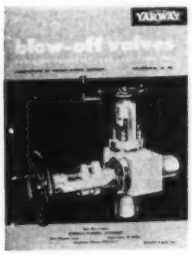
258—Drop Forged Couplings

New drop forged Bonney Flats described in this bulletin are "half couplings" that are beveled for convenience, tapered for strength, flared for flow, and drop forged for strength and ruggedness. In larger sizes the flat Weldolet provides an integrally reinforced nozzle for vessel heads and caps. *Bonney Forge & Tool Works.*



259—Tees

Brazolets used for silver brazing outlets to copper or brass pipe or tubing are described in this bulletin. The outlet portion is brazed or screwed. This construction allows rapid installation of random length mains and subsequent attachment of outlets, plus additional cost savings compared with conventional tees. *Bonney Forge & Tool Works.*



260—Blow-off Valves

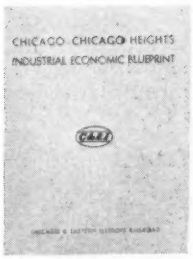
Bulletin B-434, 24 pages, describes the Yarway line of blow-off valves for higher pressures (above 400 psi). Gives data on materials, dimensions, specifications, and operation of Unit-Tandem valves for pressures up to 2500 psi, seatless valves to 1500 psi in tandem, and hard-seat valves for pressures to 2500 psi. *Yarnall-Waring Co.*

PLANT SITE SELECTION



261—Plant Sites

"Look Where a Site is Production-Right," 24-page brochure, presents data useful to consultants and executives responsible for new plant location. Illustrated with colored maps, it describes power, fuel, labor, water, weather, key materials, transportation, and plant sites that offer best plant site possibilities. *Baltimore and Ohio Railroad.*



263—Chicago Area

"Chicago & Chicago Heights Industrial Economic Blueprint" tells what industrial plant sites are available in these areas; where they are in relation to transportation, shipping, and other facilities; what materials are plentiful; what the labor situation is; kinds of housing and schools available. *Chicago & Eastern Illinois Railroad.*



262—Bedford, Ohio

"Industrial Park in Metropolitan Cleveland" outlines the advantages of Bedford, Ohio, 1½ miles from Cleveland city limits, where a 200-acre area is available for medium-sized industries and distribution facilities. Labor force, taxes, transportation, raw materials, utilities, and community are described. *Erie Railroad.*



264—Plant Site — Marley Neck

"Where Can You Pick a Plant Site Plum Like This?" is a broadside describing the largest deepwater plant site on the Atlantic seaboard, Marley Neck, Port of Baltimore. The booklet includes colored maps and a comprehensive air view of some 4200 acres on Chesapeake Bay near the heart of the city. *Baltimore and Ohio Railroad.*

POWER EQUIPMENT AND FUELS



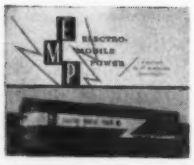
265—Automatic Packaged Boilers

The Dutton EconoTherm boiler has everything you're looking for in a compact, automatic packaged boiler, according to four-page bulletin EC-1056. In sizes through 500 hp, the units feature modern welded boiler shell, rotary combustion, and a choice of forced draft or induced draft fans. *Dutton Boilers, Div. of Hapman-Dutton Co.*



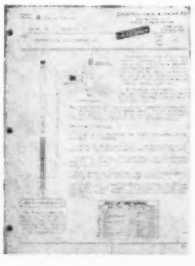
267—Forced Draft Gas Burners

General description, features, standard operation, special models available, specifications, and a photo of a typical installation of the Webster Models C and CJ Dynetic forced draft gas burners are given in bulletin B14. Special models available are listed. Burners have ratings from 800,000 to 3,200,000 Btu per hr. *Webster Engineering Co.*



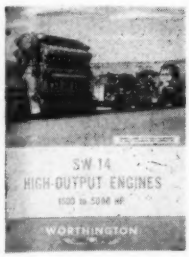
266—Mobile Power

Eight-page bulletin 26M57SS covers Electro Mobile Power, a new tool in a-c generation for utilities. It explains how best to provide for the short time peak, gives operating costs, and lists features of the EMP source. Specifications and an elevation drawing are given. *Electro-Motive Div., General Motors Corp.*



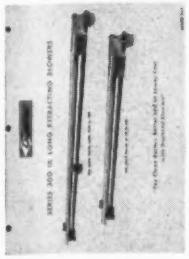
268—Gage Glass Tool

New data unit 301 describes and illustrates method of operation of the Jerguson gage glass cleaning tool that makes use of brushes to clean, quickly and efficiently, the inside of liquid level gage glass. Tool consists of a stainless steel rod with a bronze T handle, operating inside a stainless steel tube. *Jerguson Gage & Valve Co.*



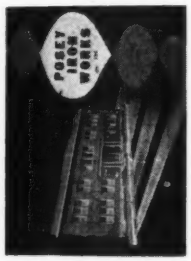
269—High Output Engines

High output, turbocharged SW 14 engines, 1500 to 5000 hp, are described in 12-page bulletin S-500-B60A. These engines, designed for use wherever economical continuous power is required, are available as oil diesel, dual fuel diesel spark ignition gas, or tri-power units. Construction features and ratings are given. *Worthington Corp.*



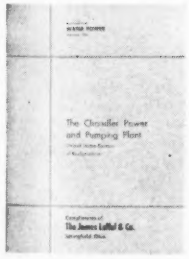
270—Blowers

"You Clean Boilers Better and at Lower Cost with Diamond Blowers," 14-page bulletin 2111, details construction features of the Series 300 IK Long Retracting Blowers. It describes the stationary gear motor drive, motor and control terminal facilities, valves, nozzles, carriage drive, and accessories. *Diamond Power Specialty Corp.*



271—Boiler Company Background

This 16-page booklet was designed to acquaint you with the Posey Iron Works Co.—its six divisions, Steel Plate, Brick Machinery, Iroquois, Foundry, Industrial Heating, and Steel Form—and the manufacturing advantages provided by their extensive facilities. Typical products of each are pictured. *Posey Iron Works, Inc.*



272—Hydraulic Turbines

Details on the Leffel turbines that drive both power generation and pumping units at the United States Bureau of Reclamation Chandler Power and Pumping Plant in the state of Washington are given in 12-page bulletin 1098-E. Descriptive literature on other recent Leffel turbine installations will be enclosed. *The James Leffel & Co.*



273—Standardized Boilers

Bulletin WT-11 describes and illustrates "S" type or standardized watertube boilers for capacity ranges from 10,800 to 50,000 lbs steam per hour .... at pressure ranges from 100 to 600 psi. Complete boiler specifications on 22 models are given. Boiler drawings show tube arrangements, dimensions, and construction details. *Bros. Inc.*



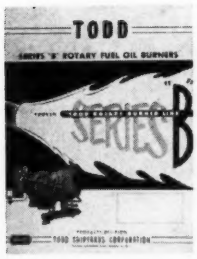
274—Electric Plants

Catalog KEP56-1, 24 pages, shows the line of Kohler electric plants used as an independent source of electricity for sole supply and for automatic standby when central station power fails. Sizes range from 500 w to 50 kw, gasoline and diesel. Battery charging units in 6, 12, 36, and 140 v capacity are described. *Kohler Co.*



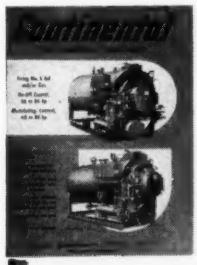
275—Packaged Boilers

Bulletin BA-256, four pages, presents in table form complete design specifications for Continental automatic boilers with 100 to 500 hp ratings with modulating control. The bulletin illustrates and describes advantages and features of the design. Boilers fire No. 2, 5, and 6 oil and/or gas. Specifications given. *Boiler Engineering & Supply Co., Inc.*



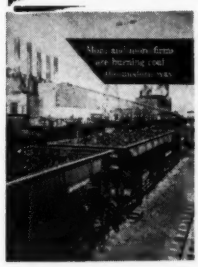
276—Rotary Burners

The new Todd Series B Rotary Fuel Oil Burners are summarized in four-page bulletin TD56-82X. It includes a burner size selector chart and lists 11 advanced design features of seven basic sizes rated from 400,000 to 22,500,000 Btu per hr, with oil capacity from 3 to 150 gal per hr. *Products Div., Todd Shipyards Corp.*



277—Packaged Boilers

These two bulletins cover Series E and F Continental automatic boilers with ratings of 20 to 80 hp, with on-off control and modulating control. Units use No. 2, 5, and 6 oil or gas or can be furnished to burn either. Bulletins give specifications, dimensions, capacities, types, and illustrations of various sizes. *Boiler Engineering & Supply Co., Inc.*



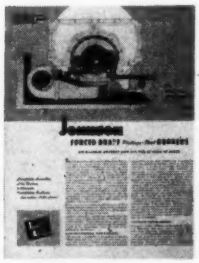
278—Modern Coal Installations

"More and More Firms are Burning Coal the Modern Way," 20-page brochure, covers case histories of coal burning installations in new construction and in older plants that have been modernized. Data sheet is given for each installation, listing the equipment, location, and the consulting engineer. *Bituminous Coal Institute.*



279—Atomizing Burners

The Todd Vee-Cee Type Variable Capacity Mechanical Atomizing Fuel Oil Burner for installations with widely fluctuating loads is fully described in four-page bulletin TD56-16X. Bulletin shows special construction that gives uniform, easily oxidized spray, constant pressure, and quick cold starting. *Products Div., Todd Shipyards Corp.*



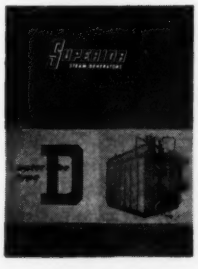
280—Forced Draft Package Burners

If your client needs a factory assembled burner that can be installed with minimum cost and time, send for four-page bulletin 10M-2-15-57 on the Johnson forced draft package burner. Units that burn oil, gas, or either are pictured with a description of operation and special construction features. *S. T. Johnson Co.*



281—Diesel and Dual Fuel Engines

This complete file, on industrial diesel and dual fuel engines of 215 to 1025 hp range, continuous service, describes White Diesel Engine Division's heavy duty units for generating sets, large power shovels, sewage plants, compressor drives, pipelines, dredge pumps and similar services. *White Diesel Engine Div., White Motor Co.*



282—Water Tube Generators

Water tube Type D Superior steam generators with capacities up to 50,000 lb steam per hour are described in eight-page bulletin. With the literature comes a 12-page folder of specifications prepared to aid consulting engineers in selection, evaluation, and specification of water tube packaged units. *Superior Combustion Industries, Inc.*



283—Dual Fuel Burners

The Webster Cyclonetic dual fuel burner is illustrated and described in four-page bulletin B11. The burner is designed to operate on either gas or light oil, with fully automatic operation on both fuels. Dimensional drawings, a chart of dimensions, capacities, and specifications are given for each size. *Webster Engineering Co.*



284—Mobile Generating Stations

Eight-page bulletin 23M57RL describes a 500-kw mobile highway generating station for utilities, providing for disaster protection, planned outage, standby power, service to new demands, local seasonal peaks, and line relocation. Each component of the trailer is described and dimensions are given. *Electro-Motive Div., General Motors Corp*



285—Spiral-Wound Gaskets

General catalog, 28 pages, tells about the development of the original spiral-wound gasket and its present applications in aviation, atomic research, process industries, power plants, and ships of the Navy and Merchant Marine. It also lists various metals and fillers used in the manufacture of these gaskets. *Flexitallic Gasket Co.*



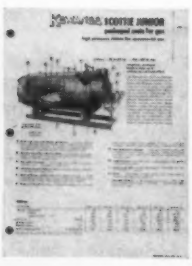
286—Boilers

Bulletin AD-162 describes Cleaver-Brooks line of boilers built with hinged doors and fully automatic control. Advantages of four pass, forced draft design, five square feet of heating surface per boiler horsepower for the CB models, 15-200 hp, oil, gas, or combination fired, are described and illustrated. *Cleaver-Brooks Co.*



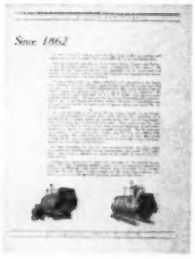
287—Stokers

Bulletin 800 deals with RotoStokers Type C-C (continuous cleaning). These are overthrow spreader stokers with horizontal reciprocating grates, which continuously move the ash forward, discharging it at the front. Operation is smokeless over a wide range of capacities for boiler sizes 5000 to 75,000 lbs per hr. *Detroit Stoker Co.*



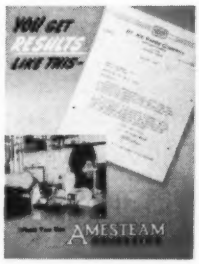
288—Scotch Type Boilers

Bulletin 3310-3 (gas) and 3311-3 (oil) on Scotch type package boilers for high pressure steam at 125-150 lbs wp gives complete description with cut-away view, ratings, and dimensions for six sizes, capacities from 18 to 75 hp. Shipped complete with controls and integrated gas or oil burner. *American-Standard, Kewanee Boiler Div.*



289—Boilers and Stokers

Complete descriptive and specification information on rugged Scotch boilers for gas, oil, and coal firing, and automatic underfeed stokers for Scotch type boilers, is given in 28-page bulletin 236. This well illustrated brochure includes test results, performance data, and complete details of design and construction. *The James Leffel & Co.*



290—Packaged Boilers

New four-page bulletin GB-1 describes savings made by installation of Ames packaged boiler. Typical installations show how low installation costs, low maintenance, fewer wearing parts with longer life, and high efficiencies have benefited users, and how Amesteam generators can reduce any boiler room cost. *Ames Iron Works, Inc.*



291—Steam Condensers

Some of the recent additions to this company's line of power plant condensers are pictured and described in this 24-page booklet. Included are sections on condenser engineering design factors, air removal equipment, steam condenser specialties, and maintenance. Specifications are given. *Condenser Service & Engineering Co., Inc.*



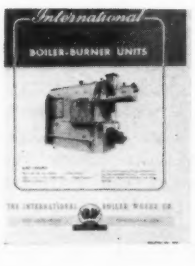
292—Stokers

Bulletin 40 deals with RotoGrate Stokers, overthrow spreader stokers with moving grates that discharge ash at front. It describes overthrow rotor mechanism, drives, special air seals, and convertible grate system that permits efficient handling of load swings of 10 to 1, for generator capacities up to 400,000 lbs per hr. *Detroit Stoker Co.*



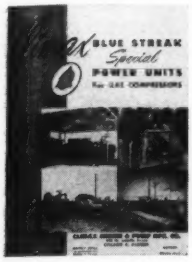
293—Stationary Gas Engines

Bulletin SA-542-D gives specifications and performance data on V-122 and V-125, 12 cylinder stationary gas engines, capable of operation up to 520 and 605 maximum hp respectively. Units are for standby or continuous duty power for sewage treatment plants, municipal water works, and other industrial applications. *Climax Engine Mfg. Co.*



294—Boiler-Burner Units

The complete line of International boiler-burner units are described in bulletin 900. Available in 35 sizes for either high or low pressure hot water or steam service, these units provide the superior performance features of water tube boilers plus the advantages of burner selection and separate delivery. *International Boiler Works Co.*



295—Engines for Gas Compressors

Bulletin SA-611-A gives specifications and performance data on 6, 8, and 12 cylinder gas engines, with a continuous duty horsepower range of 118 to 348. Capable of operation on natural gas or butane, units are for standby or continuous duty power for booster station, field gas lift, or plant service. *Climax Engine Mfg. Co.*



296—Natural Circulation Boilers

"Natural Circulation Contributes to the Advance in High-Pressure, High-Capacity Boiler Units," 12-page bulletin 3-544, by S. T. Mackenzie and G. W. Kessler of B&W, gives the history of development of these more economical boilers. Figures, graphs, and charts are based on the B&W Cyclone furnace. *The Babcock & Wilcox Co.*



297—Condenser Expansion Joints

Discussion of expansion problems of turbine exhausts with special reference to modern, large or twin condensers is presented in this four-page bulletin. It shows construction of the Henry Pratt Rubber Belt Expansion Joint, and details advantages, such as simplified engineering of piping and temperature tolerance. *The Henry Pratt Co.*



298—Packaged Boilers

How Superior's four-pass boiler design lowers steam costs is explained in 20-page booklet. Rotary burner, gas burner, controls, and built-in induced draft feature are each described. Cutaway drawing shows path of combustion gases through the four passes. Data and dimensions are presented in table form. *Superior Combustion Industries, Inc.*



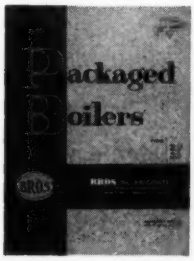
299—Diesel and Dual-Fuel Engines

A complete catalog containing 80 pages describes diesel and dual-fuel engines (including sewage gas engines) ranging from 100 to 2150 hp. Engines are available with speeds to suit a wide range of fixed or skid-mounted engine applications. Cross sections and graphs give engineering data. *White Diesel Engine Div., The White Motor Co.*



300—Cyclone Furnace Boilers

"Cyclone Furnace Boilers," 14-page bulletin 3-571, by George W. Kessler of B&W, outlines the development of the Cyclone furnace. It gives charts of suitability tests of coals; compares ash disposition in the Cyclone furnace and pulverized coal fired boilers; and discusses possible new designs for reduced costs. *The Babcock & Wilcox Co.*



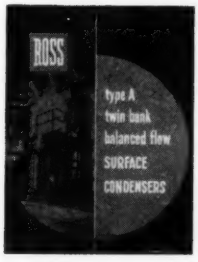
301—Packaged Boilers

Bulletin WT-10 describes and illustrates packaged boilers, with capacities from 8500 to 50,000 lbs per hour at standard design pressures up to 250 psi. Drawings and specifications, design and construction features are given in detail. Bulletin also shows how these boilers fit into your clients' planning for future needs. *Bros. Inc.*



302—VP Packaged Boilers

Catalog P391, 16 pages, describes the new Type VP package boiler. Following a section of background information is an outline of principal design features. These boilers are shop assembled and provide steam capacities from 4000 to 42,000 lb per hr. Space requirements and specifications are in table form. *Combustion Engineering, Inc.*



303—Surface Condensers

Twin Bank Balanced Flow design surface condensers — complete description, design details, exclusive features, and numerous photos of public utility and industrial power plant installations — are presented in 32-page bulletin 8.2K1. Details of Single Bank Balanced Flow design are in bulletin 8.1K1. *Ross Heat Exchanger Div. of American-Standard.*



304—Forced Draft Burner

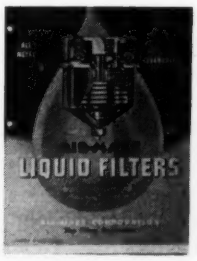
Fundamental difference between an ordinary gun type burner and the Johnson Bankheat forced draft burner is explained in bulletin 10M-2-57. Installation drawings show the burners in operation in warm air, hot water, and steam systems. Sizes and capacities are listed for units burning oil, gas, or a choice of either. *S. T. Johnson Co.*

PROCESS EQUIPMENT



305—Heat Transfer Costs

"How to Cut Heat Transfer Costs," bulletin IP-356, features a detailed description of Tranter Platecoil construction, including specifications and dimensions. It lists and illustrates ten major advantages claimed for Platecoil and detailed sketches show 14 ways it has solved industrial heating problems. *Platecoil Div., Tranter Mfg., Inc.*



306—Liquid Filters

Bulletin LFC-556, 16 pages, explains important factors in filtering oil, fuel, and hydraulic fluids. It gives useful information on selecting proper filter size, special design considerations, and gives complete technical data on Air-Maze full flow liquid filters — including models to solve special industrial problems. *Air-Maze Corp.*



307—Mixers

"Simpson Mix-Mullers for the Ceramic Industry," four-page bulletin, outlines how this unit is used in the preparation of electronic porcelain, tile, structural clay and brick, refractories, whiteware, artware, dinnerware, and other ceramic bodies. Capacities, dimensions, and specifications on various models are listed. *National Engineering Co.*



308—Tanks and Chests

Kalamazoo vitrified glazed tile tanks and chests are described in four-page bulletin 1 55-T. Drawings and photos show how the two types of tile blocks available provide flexibility of wall design. Types, sizes, design, erection, and cost are discussed, and typical installations in industry are pictured also. *Kalamazoo Tank and Silo Co.*



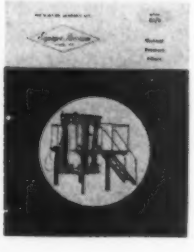
309—Silencers

Series ADS acoustic discharge silencers, designed to eliminate both high and low frequency noises caused by high velocity steam and air discharged to the atmosphere, are described in four-page bulletin 265. Specifications are given for optimum silencing, standard silencing, and for heavy industrial areas. *Burgess-Manning Co.*



310—Air Filters

Bulletin 117, eight pages, covers the operation of the Adams TR air filter, in which movement of compressed gas is used to achieve initial separation, and second stage separation is by defusion through a permanent Poro-Stone element that is unaffected by oil or moisture. Specifications and dimensions are listed. *R. P. Adams Co., Inc.*



311—Filters

Bulletin EF/2 describes design and engineering features of Durco-Enzinger vertical pressure filters for severe chemical service. Each Durco-Enzinger filter shell is built of the correct alloy or non-metallic material to best meet the requirements of a specific job. These filters are built for pressures to 500 psi. *The Duriron Co., Inc.*



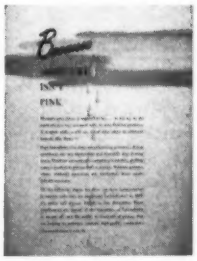
312—Laminated Fiber Disc Filters

Nugent laminated fiber disc filters are illustrated and described in this new 16-page bulletin 7C. The bulletin provides complete information on the design, construction, specifications, and capacities of standard, high pressure, and duplex models. Also included are special purpose assemblies and accessories. *Wm. W. Nugent & Co., Inc.*



313—Production Facilities

"Facilities & Products," 92 pages, is a presentation of a portion of the facilities acquired by Newport News during 68 years of continuous operation, together with some of their industrial products, such as paper and pulp machinery, castings and forgings, pipelines, turbines, and compressors. *Newport News Shipbuilding & Dry Dock Co.*



314—Humidity Control

Bulletin 222 is a 32-page manual covering many examples of increased operating efficiency due to humidity control. Equipment illustrated includes air conditioning type Lectrodryers for maintaining lower humidities in rooms, high and low pressure air and gas dryers, breathers for storage tanks, and filters. *Pittsburgh Lectrodryer Corp.*



315—Industrial Equipment

The complete line of Mahon industrial equipment is described in 12-page catalog A-657, including finishing systems; metal pickling, cleaning, and rust proofing equipment; drying and baking ovens; spray booths; sludge segregators and unloaders; filtered air supply systems; dust collectors and fog filters; and special equipment. *The R. C. Mahon Co.*



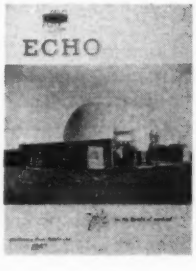
316—Vapor Condensers

Two-page bulletin 129R describes and diagrams functions and operation of Aero vapor condenser, new equipment to replace barometric type condensers that require large supplies of water and can not attain as high a vacuum. Uses illustrated include condensing steam, vapors, chemicals and intermediates, and reflux cooling. *Niagara Blower Co.*



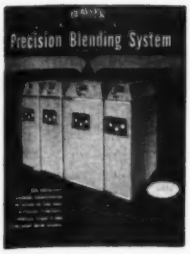
317—Picture Story

This 48-page, two-color, illustrated book is designed to portray the company's extensive metal fabricating and production facilities, its products and services, and its capacity to serve industry. In this book, the activities, products, and production methods of the eight divisions of the company are treated separately. *The R. C. Mahon Co.*



318—Process Equipment

The 100th anniversary issue of Graver's employee magazine, the *Echo*, contains the story of Chicago's Lake Calumet Harbor project, for which Graver built a tower tank; descriptions of an atomic power plant, alloy fabrications, sugar clarification, and special tankage for caustic and aluminum production. *Graver Tank & Mfg. Co., Inc.*



319—Proportioning Equipment

This twelve-page bulletin includes typical installation diagrams and complete details of multi-liquid proportioning and blending systems for liquid production processing. Simplicity and compactness of the Xacto Blending System is explained and illustrated with flow diagrams. Typical wiring diagrams also are given. *Bowser, Inc.*



320—Handbook of Crushing

"Handbook of Crushing," 40-page booklet, presents a wealth of data for any engineer faced with the problem of selecting the proper crusher for a certain job, or with analysis of a present installation. It gives details of selection, capacities, arrangements, types, and sizes. *Pennsylvania Crusher Div. of Bath Iron Works Corp.*



321—Compressed Air Drying

Four-page bulletin 223B covers the Lectrodryer equipment designed especially for handling compressed air, with particular reference to instrument air applications. It provides data on need for instrument air drying, moisture content of compressed air, and proper dewpoint and relative humidity. *Pittsburgh Lectrodryer Corp.*



322—Chemical Processing Tanks

Typical Wendnagel wood tanks manufactured for use in chemical processing are shown in this two-page bulletin. Resistance to decay, acids, and chemicals, and superior insulating properties are pointed out. Types for fire protection, water storage, wine storage, and scrubbing towers are illustrated. *Wendnagel & Co., Inc.*



323—Vapor Collectors

Vapor, mist, and fog control bulletin 622-3 illustrates the complete line of Aget Miskop Vapor Collectors and gives specifications on each model. Applications throughout industry are described in detail and illustrated. Ways in which Miskops can improve production and cut down product rejects are shown. *Aget Mfg. Co.*



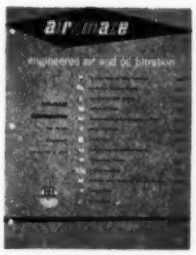
324—Mixing Equipment

Catalog 15 discusses types of blending equipment for chemical and process industries. Tables of dimensions and capacities are given for Twin-Shell production and "Liquid-Solids" blenders. Operating principles are outlined. Ribbon and double cone blenders are covered as well as special heat exchangers. *The Patterson-Kelley Co. Inc.*



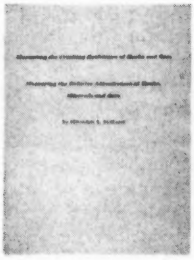
325—Wood Tanks

Wendnagel Tite wood tanks, tubs, and sinks for all types of industries are described in four-page bulletin 23. Suggested uses will give you an idea of how these products fit in with your clients' needs. Examples shown include tanks for sprinkler systems, processing, general water supply, and metal pickling. *Wendnagel & Co., Inc.*



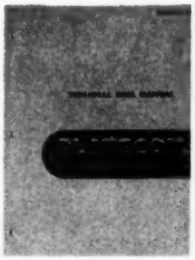
326—Air and Oil Filters

Bulletin ACL 157 gives design and performance data on the complete line of air and oil filters. Panel, oil-bath, oil-wetted, and dry type filters; low and high pressure oil and fuel filters; air intake silencers, spark and flame arresters; breather and air line filters are included with cutaway illustrations. *Air-Maze Corp.*



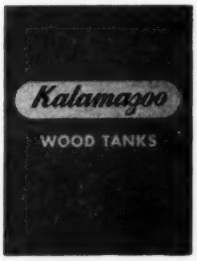
327—Crushing Resistance

"Measuring the Crushing Resistance of Rocks and Ores," 12-page booklet written by Benjamin B. Burbank, noted metallurgist, presents methods and equipment for measuring crushing resistance and abrasiveness of rocks, minerals, and ores. Detail sketches of testers are included. *Pennsylvania Crusher Div. of Bath Iron Works Corp.*



328—Heat Transfer Manual

Technical Data Manual 514-C contains technical and engineering information concerning Tranter Platecoil heat transfer capacities and characteristics. Informative charts and tables based on research, experimentation, and field experience provide valuable short cuts in selection of heating and cooling systems. *Platecoil Div., Tranter Mfg., Inc.*



329—Wood Tanks

Eight-page bulletin 655-W explains why wood tanks can meet conditions other types of tanks cannot. It describes round, rectangular, and special tanks, vats, boxes, sinks, and flumes and lists possible uses for each along with the type of hardware and lining available, and gives installation photos. *Kalamazoo Tank and Silo Co.*



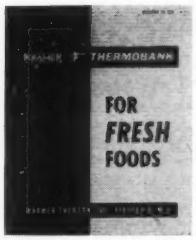
330—Fabrication Techniques

An interesting 20-page folder, prepared for Graver's centennial open house in its East Chicago plant, tells the story of the company's growth and changing techniques of fabricating since 1857. Well illustrated, it provides a view of industrial America in terms of the development of a leading fabricator. *Graver Tank & Mfg. Co., Inc.*



331—Refrigeration Components

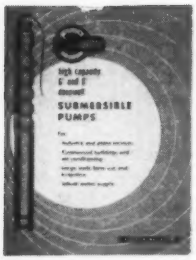
Catalog form G-124R describes semi-hermetic refrigeration condensing units and motor compressors, ¼ through 3 hp. Included are air-cooled, water-cooled, combination air-and-water-cooled, and truck units. Illustrations and specifications of seven models are given. *The Brunner Co., subsidiary of Dunham-Bush, Inc.*



332—Refrigeration Equipment

Kramer "F" Thermobank 12-page bulletin TV-380 introduces new concept in fresh foods refrigeration. It features the automatic re-evaporative hot gas defrost system that maintains ideal and constant storage conditions of 30 to 32 F. Dimensions, capacity tables, operating facts, and rapid selection tables are given. *Kramer Trenton Co.*

PUMPS AND COMPRESSORS



333—Deep Well Submersible Pumps

Bulletin B-1000 describes Sumo's 6- and 8-in. deep well submersible water supply pumps, widely used for plants, schools, commercial buildings, and all types of services such as water supply, air conditioning, processing, and fire protection. Pump and motor are coupled together as a complete unit and operate under water. *Sumo Pumps, Inc.*



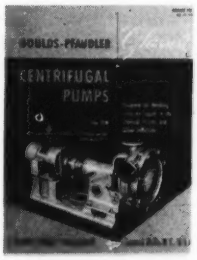
338—Double Suction Pumps

Performance data, dimensions, and specifications on the De Laval single-stage double-suction Types L, M, and P centrifugal pumps, with capacities of 1000 to 20,000 gpm and heads to 350 ft, are presented in six-page bulletin 1004. Features, construction, dimensions, and advantages are described. *De Laval Steam Turbine Co.*



334—Submersible Pumps

This 68-page portfolio—especially compiled for the consulting engineer—contains a series of engineering fact sheets on the submersible pump, complete with drawings, charts, and performance curves. It includes information on selection, applications, special benefits of design, and trouble shooting. *Byron Jackson Pumps, Inc.*



339—Glassed Pumps

The new glassed centrifugal pump that resists chemical attack from corrosive liquids — the result of over three years of mutual research and development by Goulds and The Pfaudler Co. — is illustrated and described in bulletin 725-2. The pumps are built in four sizes for capacities up to 700 gpm. *Goulds Pumps, Inc.*



335—Double Suction Pumps

De Laval single stage double suction Types T, U, and W centrifugal pumps for handling large volumes of water are described in six-page folder 1005. Advantages of each construction feature are detailed and a cutaway drawing given. Double volute pumps for heads of 250 feet and higher are described briefly. *De Laval Steam Turbine Co.*



340—Submersible Pumps

Sumo deep well submersible pumps, that operate inside the well completely submerged in water, need no pump house, are unaffected by freezing weather and floods, and are safe from tampering, are described in bulletin B-254A. It details construction features and gives selection data on 4 and 6 in. pumps. *Sumo Pumps, Inc.*



336—Solids Pumps

The Wemco Torque-Flow Solids Pump, a new concept in materials handling, is described in four-page bulletin P10-B6. It covers pumping operation that permits handling of solids without clogging, and the completely open chamber and recessed impeller. Areas of service are described, along with specifications and operating data. *Western Machinery Co.*



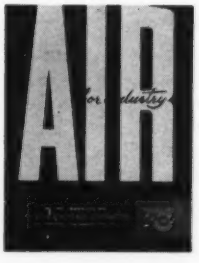
341—Industrial Pumps

"Verti-Line Close-Coupled Industrial Pumps," 12-page reference bulletin 1100, contains a valuable and easy to use table for determining horsepower, capacity, and head for vertical pumps, along with sectional views, material specifications, schematic application drawings, and photos of installations. *Layne & Bowler Pump Co.*



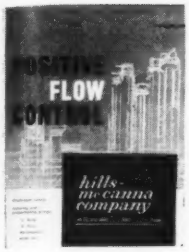
337—Submersible Booster Pumps

Verti-Line submersible booster pumps and motors (designed by Layne & Bowler and General Electric) are described in four-page folder 400. It gives specifications, selection tables, and application data. Sketches show pumps in typical installations for cooling tower service, sump operation, and fire protection. *Layne & Bowler Pump Co.*



342—Motor Driven Compressors

Bulletin M-81 provides engineering details and specifications on the M line of motor-driven compressors. It gives construction details and application for industrial air and gas compression service. Space plans and dimensions are given in drawings along with specifications. Sizes are 200 to 6000 hp. *The Cooper-Bessemer Corp.*



343—Positive Flow Control

Bulletin 800 describes in detail four basic models of precision proportioning pumps for accurate and positive proportioning of flow in the range of 0 to 730 gph. Diaphragm valves, including those made of high temperature plastics, for services requiring positive closure also are covered and specifications given. *Hills-McCanna Co.*

To order personal copies of these bulletins, please fill out the card between pages 2 and 3 or 34 and 35.



344—Centrifugal Pumps

Bulletin 300, six pages, describes general service Unipumps. Versatility in mounting is pictured and discussed. Folder includes giant pump selection table from 10 to 1700 gpm, heads from 15 to 260 feet for fast reference. Cutaway illustrations show construction. Principal pump and motor dimensions are described. *Weinman Pump Mfg. Co.*



345—Rotary Positive Gas Pumps

Bulletin 31-B-17 deals with rotary positive displacement gas pumps, 7-in. gear diameter and smaller, and accessory equipment. Selection tables, dimensions, performance data, and illustrations for 18 standard sizes are given for 0.5 sp gr gas, capacities 5 to 670 cfm at pressures 1 to 6 psig. *Roots-Connersville Blower.*



346—Condensation Pumps

The Model HS condensation pump, economically designed to offer maximum efficiency with lower operating cost, is presented in four-page bulletin 14-A. Pump can be used to return condensate to boiler or other points from all types of steam heating systems and process equipment. Specifications and dimensions are listed. *Skidmore Corp.*



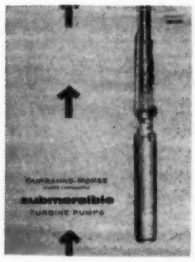
347—Refinery Process Pumps

Twelve-page bulletin covers Type PR & PS refinery process pumps, including all specifications, performance curves, cutaway drawings, dimensions, and parts lists. Capacities are up to 1200 gpm, heads to 700 feet, for use to 850 F, case pressures to 900 psi, in sizes 1 through 4 inches. *Peerless Pump Div., Food Machinery and Chemical Corp.*



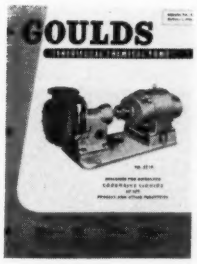
348—Chemical Pumps

Bulletin P/9a describes the installation and operation procedures for Durcopumps. Series H and Series P Durcopumps are heavy duty chemical pumps that have been designed and built to give long service with a minimum of maintenance. Durcopumps are available with capacities to 3500 gpm, and heads to 345 ft. *The Duriron Co., Inc.*



349—Submersible Turbine Pumps

Bulletin 6910 describes the Fairbanks-Morse new large line of water lubricated submersible turbine pumps designed especially for use by industry and municipalities. It is printed in several colors and shows cross sections as well as features of pumps. It also contains submersible motor ratings and capacities. *Fairbanks, Morse & Co.*



350—Centrifugal Chemical Pumps

Goulds centrifugal chemical pumps for handling acids, alkaline liquor, water, and slurries are described in Bulletin 725.4. Construction details, analysis of materials of construction, specifications, performance curves, and dimensions are included for the Fig. 3715 chemical pumps. Ten sizes provide a broad range of capacities. *Goulds Pumps, Inc.*



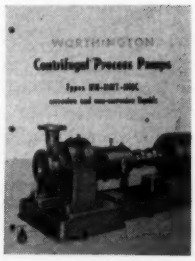
351—Pumps and Receivers

Type UV condensate pump and receiver, designed for use where returns are too low to permit use of horizontal type pumps, are described in four-page bulletin 19-A. Engineering data and dimension table are given, along with a drawing of a typical installation. Construction and operation are gone into in detail. *Skidmore Corp.*



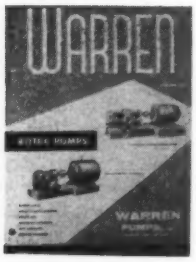
352—Irrigation Service Pumps

Bulletin 6957-1 describes the Fairbanks-Morse Pomona line of water lubricated turbine pumps, developed especially for irrigation service. Electric drive, belt drive, and gear drive pumps are shown together with a large cross-sectional illustration of the operating mechanism of the turbine pump itself. *Fairbanks, Morse & Co.*



353—Centrifugal Process Pumps

Bulletin 2148-B1 describes and illustrates a new vertically split centrifugal pump especially designed for heavy-duty service in the chemical, petroleum, and allied industries. Ratings, sizes, and materials of construction are listed for 13 pump sizes. Pumps are designed for temperatures to 850 F, pressures to 600 psig. *Worthington Corp.*



354—Positive Displacement Pumps

Warren Rotex pumps, rotary type positive displacement pumps for moderate viscosity, low viscosity, and medium pressure are featured in eight-page bulletin 50. Two general types are described: geared-in-head and external gear and bearing. Cutaways, dimensional drawings, and selection charts are included. *Warren Pumps, Inc.*



355—Compressors and Vacuum Pumps

Bulletin C-6 describes operation of Fuller rotary compressors and vacuum pumps. Cutaway drawings and typical in-plant installations are used to illustrate applications for compressing air and gases. These units have capacities to 3300 cfm, pressures to 125 psig; and produce vacuums to 22.95 inches Hg. *Fuller Co.*



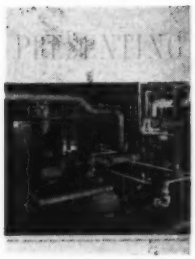
356—Sewage Transfer Pumps

Factual case histories are available on the use of solids pumps with a nonclogging "Liquid Impeller" and a range of applications from grit chamber cleanout through raw sewage, lift station service, and sludge transfer. Installation lists also available for size inspection. *WEMCO Torque-Flow Solids Pump Div., Western Machinery Co.*



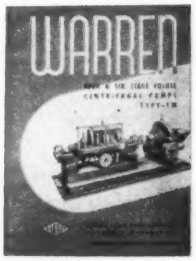
357—Centrifugal Pumps

Bulletin 400, four pages, describes frame mounted single stage, single suction centrifugal pumps. Construction features and modern design are fully discussed. These versatile low-cost pumps give maximum efficiency in liquid-handling. Principal dimensions of pump, frame, and motor are given. *Weinman Pump Mfg. Co.*



358—Vertical and Horizontal Pumps

This 110-page catalog covering entire Peerless pump line contains a valuable 20-page engineering section, charts, illustrations, performance characteristics, specifications, and descriptive data on water supply and industrial service vertical turbine pumps, general purpose pumps, etc. *Peerless Pump Div., Food Machinery and Chemical Corp.*



359—Centrifugal Pumps

Warren four- and six-stage volute centrifugal pumps, Type TM, are presented in six-page folder 241 (revised). Longer life, greater dependability, and high efficiency are pointed out. Metal specifications are given for bronze fitted, all bronze, and all iron pumps, along with cutaway drawings and dimensions. *Warren Pumps, Inc.*



360—Centrifugal Compressors

Bulletin C-83 provides engineering data on the line of Cooper-Bessemer Series RS multi-stage centrifugal compressors, 1000 to 100,000 cfm. It gives design and construction features, specifications, dimensional data, and cross-sectional and cutaway drawings for application on gas processing. *The Cooper-Bessemer Corp.*



361—Rotary Pumps

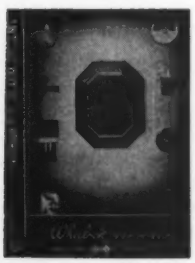
This 36-page engineering manual on Viking rotary pumps has been completely revised for the current printing. It is in three parts, covering: rotary pump fundamentals; selection of correct Viking pump in ten easy steps; and useful engineering information on pumps for handling all types of clean liquids. *Viking Pump Co.*

SOUND SYSTEMS



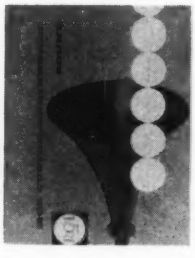
362—School Sound Systems

Eight-page brochure 7135-D-55 illustrates and describes a complete line of Underwriters' listed school sound distribution systems. It covers equipment suitable for the smallest to the largest school units. Building-block flexibility of console styles, panels, and functions is pointed out. High power intercoms are covered. *DuKane Corp.*



363—Fire Alarm Systems

"Interior Fire Alarm Systems," 20-page bulletin 3A, explains operation, supervision, uses, and features of both coded and non-coded systems. Non-coded systems are designed principally for applications where the entire building is to be evacuated; coded systems where it may not be necessary to notify entire building. *Wheelock Signals, Inc.*



364—Arena-Size Sound Systems

This brochure briefly describes and illustrates sound systems at Milwaukee County Stadium, Hollywood Bowl, the Cotton Bowl, and other outstanding facilities. Text material describes the role of careful planning and functional design in achieving a satisfactory, acoustically correct sound reenforcing system. *Radio Corporation of America.*



365—Industrial Sound Systems

Four-page bulletin 12k/Du illustrates and describes sound, alarm, and evacuation systems in use in some of the largest companies in the country. It outlines operation and functions of various types of systems designed to meet specific requirements, and emphasizes use of standard panels for custom systems. *DuKane Corp.*



366—Call Systems

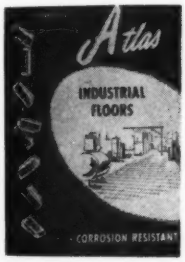
"Code Call Systems," six-page folder 4B, outlines advantages of these types of systems, which can be tied in with existing public address systems if desired. The installations are available for 20-or 40-call capacity. The 20-call system can be increased to 40 calls easily. Drawings are given of two types. *Wheelock Signals, Inc.*



367—School Sound Systems

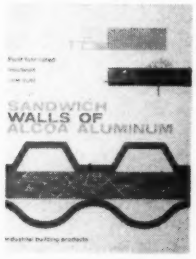
Eight-page booklet shows how central sound systems make for easier administration, more effective teaching in schools. It illustrates basic equipment that has been specially designed for school use, and describes functions of control console that provides any combination of program sources. *Radio Corporation of America.*

STRUCTURAL MATERIALS AND EQUIPMENT



368—Industrial Floors

Bulletin 3-3 fully describes Atlas corrosion resistant industrial floor "individually engineered" for each specific problem. Methods of construction and material quantity estimating table are also included. Two types of flooring are described: Alkor furfuryl alcohol resin and Vitrobond plasticized hot pour sulfur base. *Atlas Mineral Products Co.*



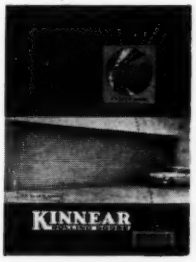
373—Aluminum Sandwich Walls

"Sandwich Walls of Alcoa Aluminum," six-page folder AD 625, explains Alcoa's answer to the erection of low-cost insulated industrial buildings — an inner and outer skin of aluminum industrial building sheet sandwiching a board of glass fiber insulation. Dimensions and finishes are given for roofing and siding. *Aluminum Company of America.*



369—Grating and Treads

Gary grating and treads tailor-made to suit your individual requirements are illustrated in a 24-page brochure. Two-page spread includes tables of safe loads, specifications, and other engineering data. Photographs also show many typical applications of the decking. *Gary Grating Div. of Rockwell Spring and Axle Co.*



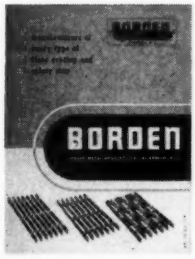
374—Industrial Doors

Bulletin 93, 24 pages, is a complete catalog of the many types of doors made by Kinnear. It gives information on the types of operation, both manual and electrical; elevation drawings; mounting methods for various applications and locations; specifications; and explains special construction features. *Kinnear Mfg. Co.*



370—Concrete Wall Panels

Insulated precast concrete wall panels and rigid steel framing combined in custom "Panel Bilt" buildings are shown in four-page pamphlet 7285. Panel and structural details are shown for each industrial and commercial purpose described. How this type of construction saves time and money is explained. *The Marietta Concrete Corp.*



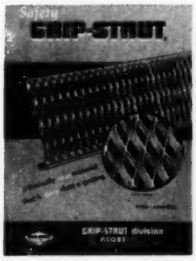
375—Grating

This 16-page catalog shows the three basic types of grating construction; gives more than 30 dimensional drawings of subtypes; eight safe load tables covering steel and aluminum grating, roadway grating, and sidewalk slabs; tables on panel widths, tread widths, and floor armor. Planning layouts are given. *Borden Metal Products Co.*



371—Curtain Wall Windows

Curtain wall designs using the Bayley curtain-wall system with aluminum projected windows are illustrated and explained in 28-page bulletin BAPW57. Suitability of this type of window — provided with or without screens — for buildings of all types of construction and architectural treatment is discussed. *The William Bayley Co.*



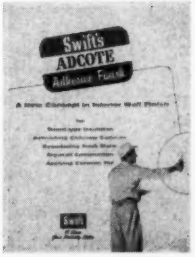
376—Safety Grating

Safety Grip-Strut, an anti-skid grating in which the vertical members are joined by integral saddle to create lateral struts of great strength, is described in 12-page booklet. General applications, installation and assembly, and fastening devices are discussed. Load tables are given for both steel and aluminum grating. *The Globe Co.*



372—Steel Stair Treads

Tread-Grip steel stair treads combine strength of construction with safe, non-slip footing, according to four-page booklet HTP2130. It describes such features as A. W. Algrip nosing, electroforged and welded construction, and twisted cross bars. Detail drawing and tables of dimensions are included. *Horace T. Potts Co.*



377—Interior Wall Finish

Swift's Adcote adhesive finish, a new concept in interior wall finish for board type insulation, refinishing concrete surfaces, resurfacing brick walls, dry wall construction, and applying ceramic tile is described in folder 9383. Principally for cooler and freezer walls, the finish retains its whiteness. *Swift & Co., Adhesive Products Dept.*



378—Tread Plate

"Alcoa Abrasive Tread Plate," eight-page bulletin AD 596, includes information on applications, design data, available sizes, and fabrication data. Advantages, such as corrosion resistance and light weight, are discussed along with construction—fused aluminum oxide rolled into aluminum base plate. *Aluminum Company of America.*



379—Rolling Doors

Twelve-page bulletin 92 demonstrates how both wood and steel RoL-TOP doors, with their straight-line outward appearance, are well suited to modern building needs. Drawings show recommended types for various applications and clearances, types of operation, special features, and dimensions. *Kinnear Mfg. Co.*

To order personal copies of these bulletins, please fill out the card between pages 2 and 3 or 34 and 35.



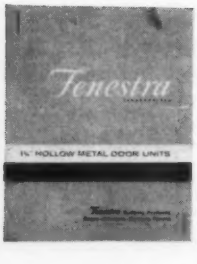
380—Grating and Treads

Bulletin 2527 features the entire line of grating and stair treads available from the Blaw-Knox Co. It tells how to specify grating, and gives a table of safe loads. Photographs of electroforged, rectangular interlocked, diagonal interlocked, U-Type, riveted, and T-Interlocked grating are included with specifications. *Blaw-Knox Co.*



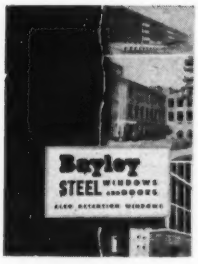
381—Asphalt Mastic Floors

This folder deals with a complete list of industrial mastic floorings: asphalt mastic, acid proof mastic, heavy duty trucking and asphalt block floors, also the new Ferrolite hot mastic floors in colors. Shows advantages and adaptability of asphalt mastic floors, especially acid proof types, with thickness and weight loads. *Fulton Asphalt Co.*



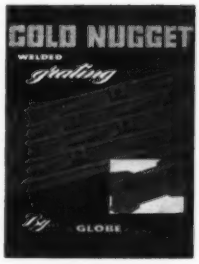
382—Hollow Metal Doors

New 28-page catalog DO-2 presents the full line of Fenestra 1¾-in. hollow metal door-frame-hardware units in flush, panel, entrance, and Underwriters' styles. Contains complete information on construction, types and sizes, design variations, installation details, plus full line of locks, hinges, and other accessories. *Fenestra, Inc.*



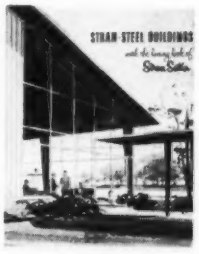
383—Steel Windows and Doors

In 36-page bulletin BSW-57, Bayley steel windows and doors (also operating units and accessories) are shown in layouts and sizes to modular standards recommended by the Metal Window Institute. Included are drawings and specifications for the new intermediate steel window wall, Series S-150. *The William Bayley Co.*



384—Welded Grating

This eight-page bulletin shows details of new lightweight, extra strong Gold Nugget Welded Grating suitable for power houses, loading docks, oil refineries, fire escapes, drain grates, and all types of heavy duty platforms. General engineering data, safe loading tables, and directions for specifying welded grating are given. *The Globe Co.*



385—Rigid Frame Buildings

Stran-Steel's new series of industrial and commercial rigid frame structures, 50- and 60-ft bow-string truss buildings, and Stran-Satin metal wall are detailed in 18-page catalog. Colorful illustrations show these buildings in use as manufacturing plants and warehouses, for retail operations, and municipal installations. *Stran-Steel Corp.*



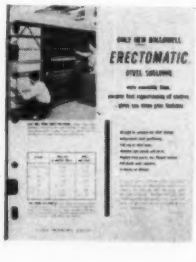
386—Colored Hot Mastic Floors

Bulletin deals with new type Ferrolite hot mastic floors in colors (red, brown, green, gray, and black), completely acid, oil, and grease proof. Complete information is presented on what Ferrolite is, how it is laid, special uses, where it can be used, and types of applications that are best suited to its use. *Fulton Asphalt Co.*



387—Drydock Construction

This report on construction methods employed on the drydock used for construction of the super aircraft carrier U.S.S. Kitty Hawk describes round-the-clock placement of 140,000 cu yds of Prepakt concrete in forty days, a record for continuous underwater concreting operations. Construction photos are shown. *Intrusion-Prepakt, Inc.*



388—Rapid-Assembly Shelving

Bulletin 2279 describes new Hallowell Erectomatic steel shelving with built-in fast-locking device that speeds assembly and rearrangement. Closeup photos detail locking action, other construction features, and show the various types of shelving offered in regular, medium, heavy, or extra-heavy construction. *Standard Pressed Steel Co.*



389—Fir Plywood Diaphragms

Now the complete information you've been wanting on Fir Plywood Diaphragms is available in this easy-to-use, handy-to-file, ten-page folder. It contains such information as: the importance and function of diaphragms, their advantages, how they are designed, and cost with specifications. *Douglas Fir Plywood Assoc.*



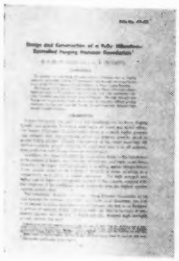
390—Asbestone Panels

Twelve-page booklet illustrates the many and varied uses of Gold Bond Asbestone panels, ideal for interior or exterior use. Made of high quality asbestos-cement sheets, laminated to asphalt-impregnated insulation board, they afford the advantages of quick, economical erection, plus built-in insulation. *National Gypsum Co.*



391—Schools of the Future

Large, colorful information sheets in this attractive folder preview the "new look" in schools. Descriptions and data are given on: demountable classrooms; stressed skin vaulted roofs; folded plate roofs; stressed skin Acousti-temp roofs; and the educational oasis... the newest concept in classroom evolution. *Douglas Fir Plywood Assoc.*



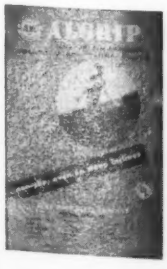
392—Forging Hammer Foundation

Twenty-four page technical article "Design and Construction of a Fully Vibration-Controlled Forging Hammer Foundation" tells how Prepakt concrete base for eight-ton forging hammer was placed under difficult conditions. Included are details of design and construction which reduced operational costs. *Intrusion-Prepakt, Inc.*



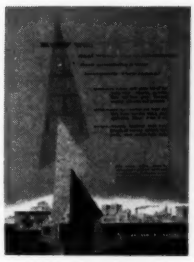
393—Watertight Masonry

"The Design and Specification of Watertight Masonry," six page bulletin "O.M." — 8A, traces common causes of leaky brickwork, and presents considerations of factors essential to sound, watertight masonry. Mortar types, selection of ingredients, proportioning, shrinkage control, and specifications are covered. *The Master Builders Co.*



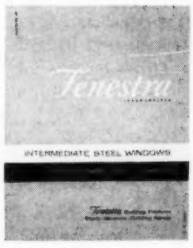
394—Rolled Steel Floor Plate

New eight-page booklet 3312 on A. W. Algrip abrasive rolled steel floor plate contains an allowable uniform load table and table of maximum sizes for plates from ⅛ to ½ inch in thickness and complete engineering and fabricating data. Many safety applications for A. W. Algrip floor plate are pointed out. *Alan Wood Steel Co.*



395—Masonry Compounds

An improved heavy base Sika-Kote cementitious paint is described in this four-page folder. With a choice of twelve new "Tropic-Glo" colors, the engineer can obtain good color harmony on masonry construction. Sika-Gard concrete floor hardener and Sika-Plug quicksetting compound are described. *Sika Chemical Corp.*



396—Intermediate Steel Windows

New 28-page catalog AR-20 presents four styles of windows for architectural, office, educational, and similar buildings: Fenestra intermediate projected, awning, casement, and combination styles with thorough coverage of types and sizes, hardware, screens, operating devices, installation details, and specifications. *Fenestra, Inc.*



397—Concrete Admixtures

This 20-page brochure covers in detail the use of admixtures to control the quality and uniformity of concrete under varying job conditions. Test data and graphs are used to illustrate the text. Also included is an entire chapter on the new statistical method for determining quality control of field concrete. *Sika Chemical Corp.*



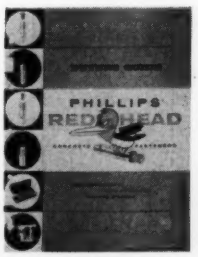
398—Architectural Products

New wide-flange shapes, 10 and 12-in. joists with 3-in. flanges, and an expanded section of loading tables are introduced in this new catalog. Also detailed are complete line of joists, studs, channels, ribbed decking, and metal curtain walls. Nailable feature permits attachment of collateral material easily. *Stran-Steel Corp.*



399—Prestressing Concrete

Two of the most common methods of computing elongation are outlined. One is based upon tensioning 70 percent of ultimate strength; the other upon application of pounds per initial load. A typical load elongation curve on ⅜- and 7/16-in. strand is included as well as tables and charts on physical properties. *Union Wire Rope Corp.*



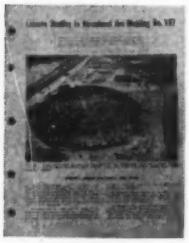
400—Concrete Fastener Guide

Catalog 57 features the complete line of Red Head concrete fasteners. Contains specifications for snap-off end, rod hanger, tie-wire, stud-anchor, flush end, and clinch nail fasteners (¼- to ⅞-in. bolt size). Diagrams illustrate impact hammer and hand installation. Accessories and electric impact hammer also are shown. *Phillips Drill Co.*



401—Steel Buildings

Bulletin SX-11557 describes and illustrates a complete selection of steel buildings featuring the Steelox panel method of construction. Specifications are given for Types S-1, S-2, S-3, S-4. Condensed data are given with general and detailed drawings showing how easily the various parts are assembled. *Armco Drainage & Metal Products, Inc.*



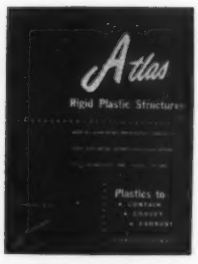
402—Structural Arc Welding

"Studies in Structural Arc Welding" is a series of case studies of welded structures of all types that reports significant details and analysis when available. Issued periodically to engineers and designers, the current series is a study of typical joint details for efficient use of steel in all types of welded designs. *The Lincoln Electric Co.*



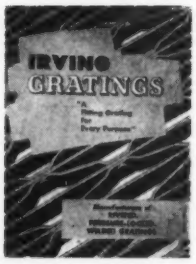
403—Prestressed Concrete Wire

This comprehensive manual deals with Tufwire stress relieved wire and strand for prestressed concrete. It features widening application of both pre-tensioning and post-tensioning, and includes engineering data on methods of determining elongation values together with typical elongation curves and tables. *Union Wire Rope Corp.*



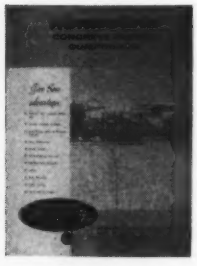
404—Rigid Plastic Structures

Bulletin 9-2 deals with Atlas corrosion-resistant rigid plastic structures that contain, convey, or exhaust corrosives. It also shows typical installation photos and resistance characteristics for both thermoplastic and thermo setting fabrications such as pipe, fittings, tanks, fume exhaust systems, and process equipment. *Atlas Mineral Products Co.*



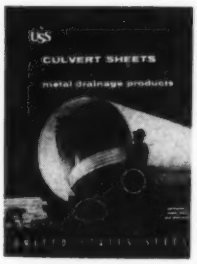
405—Grating Flooring and Treads

General grating catalog F-400 contains illustrations, descriptions, and complete engineering data on grating flooring, treads, and floor armoring (riveted, press-locked, and welded types). Irving Grating is safe, durable, fireproof, ventilating, clean, and economical for industrial and power plants and stairways. *Irving Subway Grating Co., Inc.*



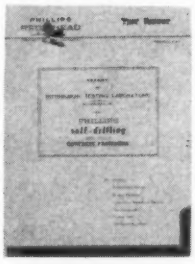
406—Concrete Curing

Horncure concrete curing compounds — 100 percent resin base curing compound, white pigmented curing compound, and wax-resin base curing compound — are described in four-page bulletin 1415. It gives advantages, use, and specification and quantity required for each of three types. *A. C. Horn Co., Inc., Sun Chemical Corp.*



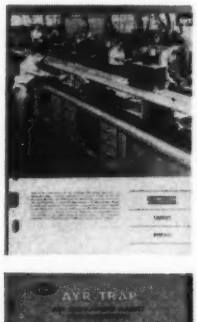
407—Drainage Products

"USS Culvert Sheets for Corrugated Metal Drainage Products," 28 pages, covers design, sizes and weights, gages, installation, and other engineering details for proper specification writing. It covers corrugated galvanized steel sheet application for metal drainage products and corrugated metal pipe and metal pipe arch. *U. S. Steel Corp.*



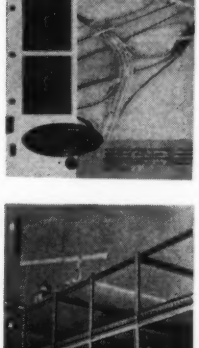
408—Concrete Fasteners

Bulletin A-1101, "Report of Pittsburgh Testing Laboratory on Phillips Self-Drilling Red Head Concrete Fasteners," includes data on pull-out load values, testing procedures, compressive strength of concrete used in tests, concrete characteristics, and a chart showing test results. Photos show specimens under test. *Phillips Drill Co.*



409—Cabinet Benches

Form 2104 is a 12-page review of Hallowell all steel cabinet benches for toolroom, test laboratory, and instrument shop. Units are available with steel, Presswood-covered steel, laminated wood, or ShopTop bench tops. Multiple unit construction and interchangeable accessories facilitate layout. *Standard Pressed Steel Co.*

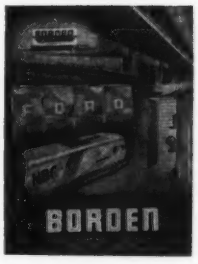


410—Air Entraining Agent

Ayr-Trap air entraining agent for concrete is described in four-page folder D19484. It explains its function in production of mass concrete and concrete paving, for ready mixed concrete, in concrete products and blocks, concrete pipe, and other uses such as for concrete curbing, planks, and flooring. *A. C. Horn Co., Inc., Sun Chemical Corp.*

411—Precast Floors and Roofs

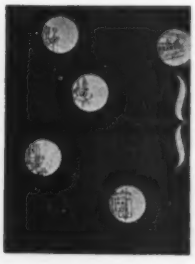
The Flexicore fire-resistant precast concrete floor and roof system is described in this eight-page bulletin. It includes details on use with structural steel, reinforced concrete, and wall-bearing construction. It gives electrical and mechanical details, load tables, design information, and complete specifications. *The Flexicore Co., Inc.*



412—Aluminum Grating

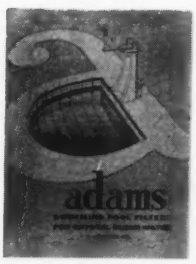
This new four-page folder features unusual uses for floor grating, including its use as sun shades for modern schools, and as low maintenance pressure-locked fencing that never needs painting. It shows dimensional diagrams of standard designs and gives safe load table for aluminum grating. *Borden Metal Products Co.*

WATER TREATMENT AND WASTE DISPOSAL



413—Water and Steam Cycles

"Industrial Water Treatment and Engineering Service" tells of the five basic lines of defense to guard against difficulties in water and steam cycles. A two-page diagram shows a water and steam cycle power plant layout and indicates the usual tests required on samples taken at designated points. *Dearborn Chemical Co.*



414—Swimming Pool Filters

Bulletin 625, 24 pages, discusses filtration for modern swimming pools of 50,000 gal capacity and over. It has sections on design features of purification and filtering systems, operation phases of filtration cycle, choosing the right filter, installation drawings, dimension charts, and table of filter sizes. *R. P. Adams Co., Inc.*

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Consulting Engineer Supplement-- Aug. 1957

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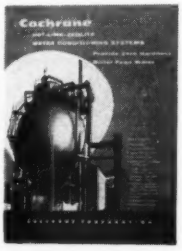
415—Water Supply

"Supplying Water for Municipal and Industrial Use," 20-page catalog, explains how the Ranney Method can provide any type of water program for these users. Horizontal collectors, infiltration galleries, vertubes, and intakes are fully described. Photographs and schematics depict each operation. *Ranney Method Water Supplies, Inc.*



416—Research Facilities

Bulletin 100, eight pages, pictures Nalco research facilities. Brief descriptions of the areas in which the company conducts research are given with information on the type of specialized studies the Nalco staff is prepared to undertake for the consulting engineer working on industrial projects of various kinds. *National Aluminate Corp.*



417—Hot Lime-Zeolite

Publication 4801-A covers the versatility and economy of Cochrane Hot Lime-Zeolite Softeners. It deals with method of operation, expected results, chemical savings, and simplicity of operation. It also points out that with addition of the zeolite stage, application of hot process is broadened considerably. *Cochrane Corp.*



418—Self-Cleaning Fluid Filters

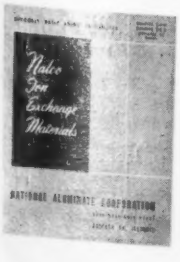
The Industrial Hydra-Shoc Filter, incorporating a new principle in filter design that uses sudden pressure drop for extremely fast cleaning, is described in four-page folder 114-1155. Colored flow diagrams illustrate the operating sequence — precoating, filtering, and Hydra-Shoc. Filter is vertical type. *Industrial Filter & Pump Mfg. Co.*



419—Industrial Water Softeners

Three basic types of industrial water softeners — Illco-Way natural Greensand, synthetic gel type zeolite, and resinous exchangers — and applications each are best suited for are presented in eight-page bulletin S-255. General specifications are given for each type of equipment and for controls. *Illinois Water Treatment Co.*

To order personal copies of these bulletins, please fill out the card between pages 2 and 3 or 34 and 35.



420—Cation Exchangers

Bulletin 58, 24 pages, gives physical data on Nalcite HCR cation exchanger and complete information on its use for commercial, municipal, and industrial water softening. It covers capacity ratings, hardness leakage, regeneration and operation for both cold and hot water service, and sodium and hydrogen cycles. *National Aluminate Corp.*



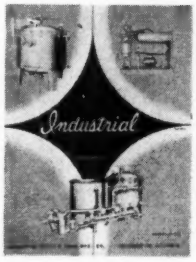
421—Fluo-Chlorinator

The Model F-1400 Fluo-Chlorinator for fluoridation and chlorination, designed for simultaneous addition of controlled quantities of both fluoride and chlorine solutions to potable water supplies, is described in catalog 70F140. Operation and construction are covered in text and illustrated by flow and installation diagrams. *Fischer & Porter Co.*



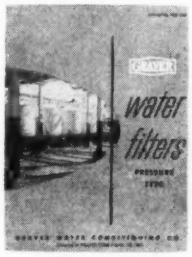
422—Filmeen Treatment

Control of corrosion in return lines through the use of Filmeen treatment is described in eight-page bulletin 5013-B. It explains how this product prevents corrosion caused by CO_2 or oxygen by forming a protective, monomolecular film on metal surfaces. Methods of application and testing are outlined. *Dearborn Chemical Co.*



423—Water and Chemical Filters

Vertical leaf filters with a wide range of uses in chemical and water purification processes are described in eight-page bulletin 111-112-1155. Features such as "lift-out" leaves with top or bottom outlets, quick opening devices, jacketed shell for temperature control, and cleaning devices are illustrated. *Industrial Filter & Pump Mfg. Co.*



424—Water Filters

Bulletin WC-107A discusses and describes Graver's pressure type water filters for industrial plants, municipalities, and institutions. Details of construction, methods of incorporating individual units into systems, and complete design specifications are included. The variety of arrangements is pointed out. *Graver Water Conditioning Co.*



425—Swimming Pool Equipment

Catalog 803, 32 pages, describes Elgin swimming pool equipment specially designed for municipal, club, school, and commercial swimming pools of moderate to large size. Gives detailed data and selection guides covering everything for the pool — filtration, recirculation, chlorination, cleaning, and diving equipment. *Elgin Softener Corp.*



426—Hot Process Softeners

Hot process softener bulletin 4800, index 2.01, 24 pages, covers the reasons for such softeners, their advantages, and types of hot process softening for varying water conditions. Designs available include integral deaerating heaters. A section is devoted to hot lime zeolite systems and chemical reactions. *Cochrane Corp.*



427—Demineralization Costs

"Nine Graphs Speed Calculation of Water Demineralization Costs," by F. H. Kahler and A. C. Reents, of Illinois Water Treatment Co., provides operating cost information on all the ion exchange methods currently in use for deionization of water — two-bed, mixed-bed, mixed-bed combination, and four-bed systems. *Illinois Water Treatment Co.*

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Consulting Engineer

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ADVERTISERS' LITERATURE

This supplement provides a current and detailed description of bulletins, catalogs, and other literature offered by advertisers in CONSULTING ENGINEER. Products and services offered are grouped into the general categories shown below. A full index is provided on the last page. Keep this supplement in the front of your catalog file and refer to it when you need product data. Four postcards are provided for ordering copies of bulletins you need.

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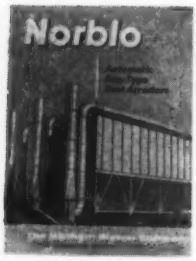
Bring your Technical Reference Files up to Date

Part 2 November 1957



1—Dust and Mist Separation

"The Modern Way to Capture Dust or Mist" describes the cyclone principle of separating dust and mist from air. It contains illustrations of typical Dustkop installations and information on types of equipment available for shipment from stock. Dimensions, specifications, and suggested uses are given for each type. *Aget Mfg. Co.*



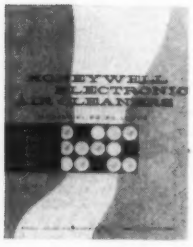
2—Automatic Dust Collectors

How the Norblo automatic bag-type dust collector can provide continuous operation at full capacity is explained in four-page folder 164-5. Dimensions and capacities are listed in tabular form. A flow diagram explains how the unit works. Each part of the collector is shown separately with a description of advantages. *The Northern Blower Co.*



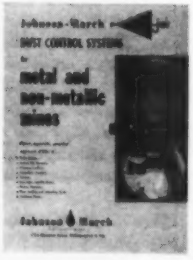
3—Electric Precipitators

Five fundamental engineering factors governing the success of precipitator installations are fully described and illustrated in a 22-page booklet, "Buell SF Electric Precipitators." Factors include positive gas flow control, uniform electrode emission, rapping method, mechanical construction, and high voltage supply. *Buell Engineering Co.*



4—Electronic Air Cleaners

Catalog 76-3335 describes Honeywell's field assembled electronic air cleaners — models F1, F2, F3, and F4. Engineering specifications and operating data are included. Capacities range from 1300 to 138,000 cfm or greater at 85-90 percent efficiency, from 5400 to 144,000 cfm at 95 percent efficiency. *Minneapolis-Honeywell Regulator Co.*



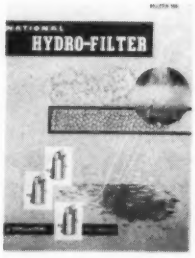
5—Mine Dust Control Systems

Catalog MM-4001, four pages, outlines the outstanding features of new Chem-Jet dust control systems for all phases of materials handling in metal and nonmetallic mines. Photos show typical points of application. It also describes new Type A Hydro-Precipitator for control of gases with dust smaller than 5 microns in size. *Johnson-March Corp.*



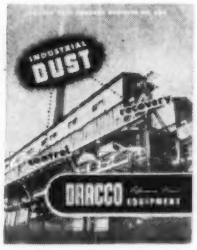
6—Industrial Dust Control

"Industrial Dust Control," 36-page bulletin, describes the complete line of Sly dust filters and gives detailed information about dust control systems and how to engineer them. It includes a description of the operating principles of the Roll-Clean Dynaclone dust filter and includes drawings and specifications. *W. W. Sly Mfg. Co.*



7—Dust Collectors

Outstanding features of the National Hydro-Filter dust collector are described in four-page bulletin 556. Ease of operation and maintenance, versatility, cost factors, separating efficiency controls, and construction and design are discussed. Dimensional data, specifications, and drawings also are provided. *National Dust Collector Corp.*



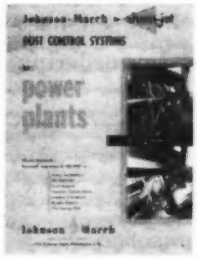
8—Industrial Dust Control

Forty-page product bulletin 800 contains comprehensive information on all five types of Dracco dust control equipment (cloth filter and cyclonic types). Bulletin is well illustrated and presents dimension and specification data, operating principles, installation case histories, and solutions to dust problems in various industries. *Dracco Corp.*



9—Centrifugal Dust Collectors

Improved design of the Norblo High Efficiency Low Static (H.E.L.S.) centrifugal dust collector includes deeper body and improved proportions and does away with dampers frequently used to overcome back pressure, according to four-page bulletin 104-3. Capacities and principal dimensions are listed. *The Northern Blower Co.*



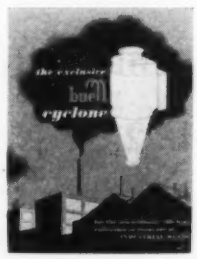
10—Power Plant Dust Control

Six-page catalog SJP-1001 describes new Chem-Jet dust control systems for suppression of coal dust at rotary car dumpers, car shakeouts, track hoppers, conveyor transfer points, coal crushers, reclaim hoppers, and coal storage piles. It includes description of new Type A Hydro-Precipitator Scrubber for dust and fume control. *Johnson-March Corp.*



11—Scrubbing Towers

Buffalo bulletin AP-525 describes application and operation of hydraulic scrubbing towers, offering excellent high-efficiency air cleaning. Unit is a wet centrifugal air cleaning device in which advantage is taken of centrifugal force, a finely atomized spray system, and scrubbing against a wetted surface. *Buffalo Forge Co.*



12—High Efficiency Cyclones

Bulletin C-103 describes the design and construction of Buell high efficiency cyclones. Features described include the exclusive "Shave-Off" port which traps an extra percentage of dust, particularly the smaller fines. Lists data necessary for specifying, covers importance of manifolding, and gives tables of dimensions. *Buell Engineering Co.*



13—Air Diffusers

Selection Manual No. 60, 80 pages, on air diffusers for air conditioning, heating, and ventilating systems, contains numerous diagrams, tables, and photographs to aid in the selection of the correct units for All-Air high velocity systems, conventional systems, and high temperature differential systems. *Anemostat Corp. of America.*



14—Air Control Devices

Catalog 200, 36 pages, "Grilles, Registers, Air Control Devices," lists important features of each type unit, gives horizontal and vertical cross sections, size selection charts, drop chart, construction details, screw hole locations, dimensions, specifications, price lists, and engineering data. *Tuttle & Bailey, div. of Allied Thermal Corp.*



15—Gravity Roof Exhausters

Twelve-page bulletin 100 gives capacities, dimensions, curb details, and construction design of the new AirXpeler Power Gravity Roof Exhausters, units of low silhouette, available as direct or belt driven. Low cost operation for low and high static pressures, and natural draft fresh air supply features are described. *Ammerman Company, Inc.*



16—Cleanable Cooling Coils

Bulletin R-50 describes and illustrates Aerofin Type R Removable-Header Water Coils. These are cleanable-tube extended-surface coils for cooling air with water. Principal advantages are easy cleaning of tubes and positive drainage. Engineering data for various pass arrangements are given to assist in selection. *Aerofin Corp.*



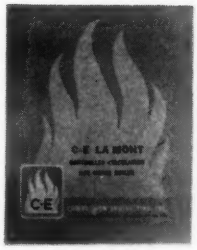
17—Refrigeration

Condensed catalog 493, eight pages, gives complete specification data on refrigeration units—air cooled, combination air and water cooled, and water cooled—in the ¼ through 100 hp range. Single and two stage compressors, compressor units, and condensing units are shown. *The Brunner Div., Dunham-Bush, Inc.*



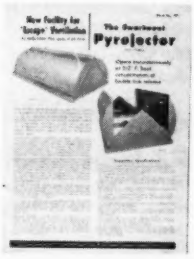
18—High Temperature Water Heating

Basic advantages of the Type LFW Forced Recirculation Generators for high temperature water are given in ten-page bulletin 700. Chart compares capital investment, operating costs, and maintenance and repairs for high temperature water and high pressure steam for district heating from central heating plant. *International Boiler Works Co.*



19—Hot Water Boiler

HCC-2, 20-page brochure, describes and illustrates the design, construction, advantages, and economies of the C-E La Mont controlled circulation hot water boiler for supplying high pressure, high temperature water for heating systems and process applications. Layouts and elevation drawings are given. *Combustion Engineering, Inc.*



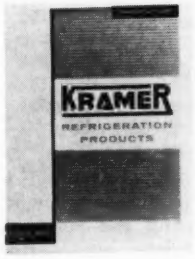
20—Fire Vents

A quick-opening fire vent to permit rapid escape of smoke, heat, and gases in event of fire is described and fully illustrated in form 701. Known as the Pyrojector, the unit installs entirely above the roof line and is opened instantly when heat melts a 212 F fusible link. Suggested specifications are given. *The Swartwout Co.*



21—Steam Heating System

"Tune in with the Weather," 16-page bulletin 540, describes Selectotherm, an automatically controlled vacuum steam heating system with a single dial control to balance heat supply against heat loss. A drawing of a typical arrangement is provided, along with specifications, a selector guide, and performance data. *Illinois Engineering Co.*



22—Refrigeration Equipment

New catalog R-400, 12 pages, on refrigeration and air conditioning units, includes Kramer's redesigned Wedge for reach-in refrigerators, Unicon air cooled condensers, Kramer All-Season Winterstat, Coolmaster, and the "L" Thermobank automatic hot gas defrosting system. Selection tables are given. *Kramer Trenton Co.*



23—Smooth-Fin Heat Exchangers

Bulletin S-55 describes new smooth-fin heat-transfer coil construction that permits closer fin spacing, greater capacity per sq ft of face area, and use of higher air velocities without turbulence or excessive friction. It also illustrates many types of extended-surface heat exchangers for heating, cooling, and processing. *Aerofin Corp.*



24—Industrial Air Filters

"The New Cambridge Aerosolve Air Filter," four-page folder, introduces a high efficiency, low pressure drop system of air filters designed for multi-filter banks in comfort and industrial ventilation or air conditioning supply systems. Filter characteristics, advantages, operation, and application data are given. *Cambridge Filter Corp.*



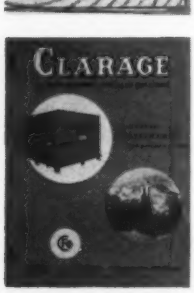
25—Propeller Fans

Bulletin A-109 gives descriptions, specifications, dimensions, and performance data on Hartzell's line of propeller fans for industrial ventilation. This 40-page bulletin covers standard, Lo-Noise, and high pressure fans; direct drive, belt driven, and bi-pass duct fans; unit heaters; and other ventilation equipment. *Hartzell Propeller Fan Co.*



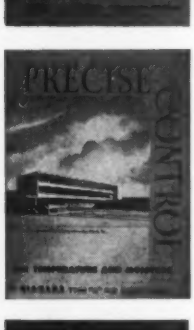
26—Ventilation Noise Control

"Controlling Ventilation Noises" is a comprehensive brochure on ventilation noise control research performed at Armour Research Foundation. It gives engineering information in tables to enable you to predict accurately the noise level a DeBothezat fan will produce. *DeBothezat Fans Div., American Machine and Metals, Inc.*



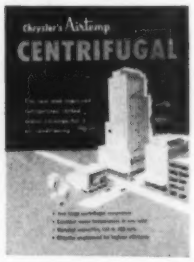
27—Air Conditioning Units

Four-page bulletin 1312 covers the Hi-Static Multitherm unit, developed principally for high velocity, conduit type air conditioning systems. Available in seven sizes, covering a volume range of about 2500 through 22,000 cfm, and suitable for systems having a static pressure of 8-in. wg maximum. Specifications are given. *Clarage Fan Co.*



28—Air Conditioning

Precision control of air temperature and moisture enable your client to produce his product in any climate, at any season, according to six-page bulletin 122. The Type "A" air conditioner described, for drying or moistening of air, is shown in typical installation photographs. Drawing points out operation. *Niagara Blower Co.*



29—Airtemp Centrifugal

This four-page piece of literature, printed in two colors, describes Airtemp's new centrifugal packages in 150 to 600 ton capacities. Information is provided on the various components and features comprising the refrigerated package. Complete engineering specifications and data will be included. *Airtemp Div., Chrysler Corp.*



30—Air Handling Units

Bulletin 780A describes air handling units that change their own filters automatically. Media loads like a camera, lasts up to a year, requires little or no maintenance. Available on Herman Nelson heating and ventilating, industrial heater, and air conditioning units. Cutaway diagram included. *American Air Filter Co., Inc.*



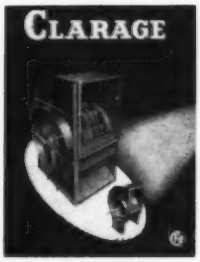
31—Wet Back Boilers

Catalog 819A deals with "wet back" Scotch type boilers for forced draft; oil, gas or gas-oil firing. Feature advantages and complete specifications are shown for 13 sizes. Sizes range in net steam rating from 6440 to 50,000 sq ft, and in net water rating from 10,300 to 80,000 sq ft. Specifications are given. *National-U. S. Radiator Corp.*



32—Room Air Conditioners

Marlo Seazonaire remote type room air conditioning units for hotels, motels, offices, apartments, institutions, and other multiple zone installations are described in 16-page bulletin 335. Typical installations of floor or vertical types and ceiling or horizontal types are shown along with construction details. *Marlo Coil Co.*



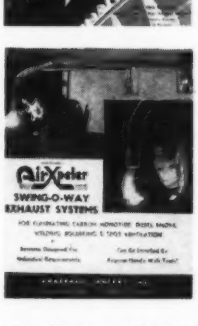
33—Fans

Catalog 221, 91 pages, presents comprehensive data on Clarage Type N fans. Information is conveniently arranged to enable engineers, designers and architects to select readily the proper fan equipment to meet specific air handling and conditioning requirements. Charts, tables, and graphs are included. *Clarage Fan Co.*



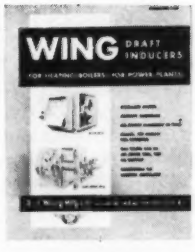
34—Cooling Coils

Marlo direct expansion and water coils are described in eight-page bulletin 11. Design features, construction, types of cooling coils available, and dimensional data are covered. The four types of coils are discussed with fins spaced either seven or eight per inch; available with 5/8- or 3/4-in. O.D. copper tubes. *Marlo Coil Co.*



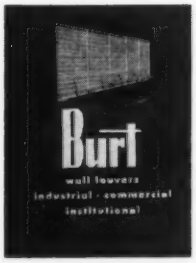
35—Movable Dust Exhauster

The AirXpeler Swing-O-Way exhaust system for eliminating carbon monoxide, diesel smoke, and welding and soldering fumes, and for spot ventilation is described in two-page bulletin 675R. Units are designed for use where traveling overhead cranes do not permit duct work from the ceiling. *Ammerman Company, Inc.*



36—Draft Inducers

Bulletin I-57 describes draft inducers for heating boilers and power plants, ranging from small domestic and commercial heating units to those for boilers up to 120,000 lb per hr. Packaged design units are factory assembled, with air-cooled fan bearings and interchangeable inlet panels. Motor, turbine, or dual drive. *L. J. Wing Mfg. Co.*



37—Wall Louvers

Burt wall louvers for industrial, commercial, and institutional installations are featured in eight-page bulletin SPV-17. Dimensional and construction data are given for fixed and adjustable louvers and for operators and screens. Description of each type of louver is accompanied by a cross-sectional drawing. *Burt Mfg. Co.*



38—Axial Fans

Bulletin B-1013, 36 pages, describes Series 203 fans for ventilation, process air-supply, and process air recirculation applications. It explains tubeaxial and vaneaxial flow principals and describes the various arrangements possible with American Blower axial fans. Recommended applications are discussed. *American Blower Corp.*

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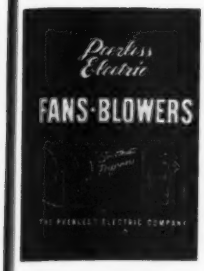
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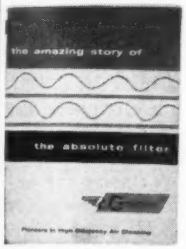
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39—Exhaust Fans

Eighteen-page bulletin SDA-160 gives features, capacities, performance data, and dimensions for commercial and industrial exhaust fans; vertical or horizontal Ventilattic fans; penthouses; automatic wall and ceiling type louvers; belt drive utility blowers; direct drive blowers; and radial blade blowers. *Peerless Electric Co.*



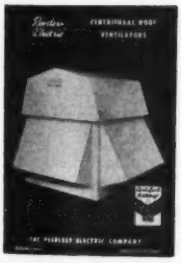
40—Air Filters

"The Amazing Story of the Absolute Filter," eight-page bulletin 106A, tells about the development of the filter for the Atomic Energy Commission and its subsequent "declassification" for use in industry where critical air cleaning problems exist. Construction, dimensions, applications, and ratings are given. *Cambridge Filter Corp.*



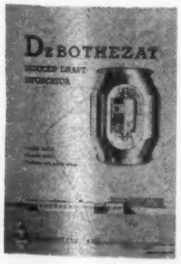
41—Ceiling Diffusers

Catalog 108, "Aerofuse Ceiling Diffusers," 72 pages, gives complete information on diffusers, volume control dampers, distributing grids, blanking baffles, plaster rings, and anti-smudge rings. It gives size selection charts for installation in different locations, dimensions, and engineering data. *Tuttle & Bailey, div. of Allied Thermal Corp.*



42—Centrifugal Roof Ventilators

Eight-page folder SDA-220 presents the new Peerless centrifugal roof ventilator. Features, construction details, complete performance data, dimensions, detail drawings, and recommended specifications are given. Other fan and blower products also are described. Engineering data are in table form for handy reference. *Peerless Electric Co.*



43—Induced Draft Bifurcators

This 20-page catalog, DB-44-55, tells about the DeBothezat induced draft bifurcator for providing constant boiler draft. It simplifies analysis of induced fan requirements and gives all manufacturers' boiler code ratings reduced to relationship of Btu per hr delivered to the steam. *DeBothezat Fans Div., American Machine and Metals, Inc.*



44—Gas Heating Equipment

Catalog GN-57 deals with a complete line of gas-fired commercial and industrial heating equipment, including suspended gas unit heaters, both fan and blower types; the Flexitemp floor model heater; two series of duct furnaces; and a horizontal furnace. It includes complete specifications and construction details. *Reznor Mfg. Co.*



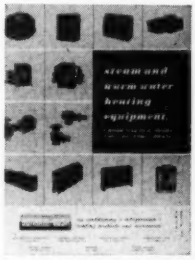
45—Vaneaxial Fans

New belt-driven vaneaxial fans, for maximum efficiency against high static pressures, are described in bulletin 450. Units overcome swirl or turbulence in duct systems with propellers and guide vanes that counteract torque and pass air through in a straight stream. Sizes 12- to 48-in. diameter, capacities to 47,000 cfm. *Aerovent Fan Co., Inc.*



46—Industrial Fans

Bulletin EX-531 describes fans for exhaust ventilation, pneumatic conveying, induced draft, and oven circulation. Medium speed, the design lends itself to protective treatment and other demands of industrial applications involving corrosion and abrasion. Stock sizes 200 to 55,000 cfm, pressures 1 to 15 in. sp. *Bayley Blower Co.*



47—Heating Equipment

Bulletin 1101F describes steam and warm water heating equipment, including everything in radiation, controls, pumps, unit heaters, and specialties. Illustrations, specifications, and installation diagrams on more than 30 pieces of equipment are given. Included is a list of cities in which the company has sales engineers. *Dunham-Bush, Inc.*



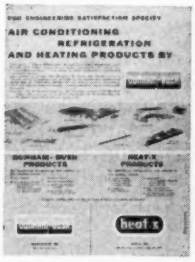
48—Space Heaters

Bulletin No. 564 describes an entirely new concept of burning fuels in direct-fired forced-air space heaters. Separate sections discuss the new burner and combustion chamber, and tables provide dimensions and engineering data. Heaters are available in output capacities from 250,000 to 2,000,000 Btu per hr. *Dravo Corp.*



49—Direct Fired Space Heaters

Bulletin F-57A-RO gives complete description and specifications on Reznor-Olson stainless steel direct-fired heaters designed for large commercial and industrial space heating applications. Models come in ten sizes from 400,000 to 2,000,000 Btu for gas, oil, or dual-fuel firing, for free-standing or suspended installation. *Reznor Mfg. Co.*



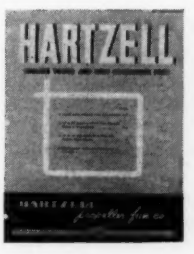
50—Heating and Cooling Products

Bulletin 6002 describes air conditioning and refrigeration products, sales, and service. Specifications, dimensions, and capacities of air handling units, blower condensers, evaporative condensers, and cooling towers are given. Included is information on water chillers, package chillers, and liquid coolers. *Heat-X, Inc., subsidiary of Dunham-Bush, Inc.*



51—Radiant Heating

"Radiant Panel Heating with Steel Pipe," 48 pages, covers the history of this type of heating, basic design, floor, ceiling, and wall panels, information on snow melting systems, pipe coil integration, design of a floor coil system, and a boiler hook-up diagram. *Committee on Steel Pipe Research, American Iron and Steel Institute.*



52—Adjustable Pitch Fans

Bulletin A-111 describes adjustable pitch fans for heat exchanger and cooling tower use and for mine ventilation. Line includes 14- and 22-ft models with formed Hartzite plastic or plastic-impregnated wood blades, 10- to 14-ft models with molded plastic blades, and 40- to 120-in. all aluminum type fans. *Hartzell Propeller Fan Co.*



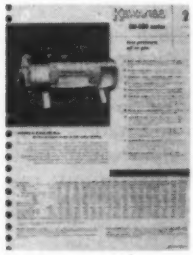
53—Industrial Fans

Bulletin PL-801, 20 pages, presents all pertinent information on industrial fans in models and capacities for every industrial ventilating requirement. Calculation of duct resistance, how to select proper unit, and placement are discussed. Dimensional and performance data are given. *Power Line Fan Co., Div. of Chelsea Products, Inc.*



54—Central Humidifier

Four-page bulletin 900 explains how hot water supplies heat for the Humidi-maker, an evaporative type central humidifier — how 170 F circulating water will evaporate two gallons of water vapor per hour or enough for humidifying a large residence. Includes installation, piping, and wiring information. *Armstrong Machine Works.*



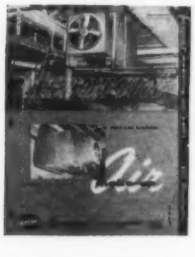
55—Scotch Type Boilers

Bulletin 3204-2 illustrates and describes in detail 16 sizes of Kewanee LW-800 Series wet-back Scotch type boilers for low pressure steam or hot water heating. Ratings are from 1,313,000 to 21,855,000 Btu per hr. Boilers are designed and rated 8.2 sq ft of heating surface per boiler horsepower. *Kewanee Boiler Div. of American-Standard.*



56—Liquid Chillers

This four-page illustrated bulletin covers a new line of Flow-Pac liquid chillers for residential and small commercial use. Units are available in air or water cooled models, in capacities from 1¾ to 5 hp. Complete selection data and dimension drawings are provided for six models along with specifications. *Acme Industries, Inc.*



57—Make-Up Air Unit

A new air make-up unit designed to temper outside air and supply it in sufficient quantities to eliminate negative pressures is described in bulletin 850. Make-up air units are available in seven unit arrangements in six sizes from 24 to 54 inches, with air capacities ranging from 4000 to 33,000 cfm. *Aerovent Fan Co., Inc.*



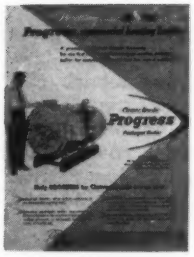
58—Utility Sets

Bulletin 8314, 52 pages, illustrates and describes the various size ranges and configurations of fan wheels and motors available in the line of Sirocco utility sets. Capacity tables are included for the full range of sizes and designs, giving motor horsepower, fan speed range, and delivery for various static pressures. *American Blower Corp.*



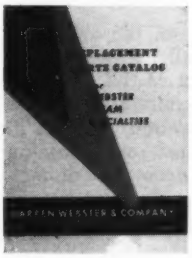
59—Dual Purpose Fire Ventilators

"Fire Prevention in Industrial Buildings" explains the reason for the spreading of the disastrous General Motors fire of 1953: lack of roof openings or any form of natural ventilation; and Colt's new combination controllable ventilator that is also an automatic fusible link fire and smoke ventilator. *Colt Ventilation of America, Inc.*



60—Packaged Boilers

Bulletin AD 157 describes newest packaged heating boiler of Cleaver-Brooks line: fully tested package, delivered to job site ready for service hook up. Forced draft, low stack temperature evidence of high efficiency. Free starting service of 500,000 to 2,010,000 Btu, hot water or low pressure steam applications. *Cleaver-Brooks Co.*



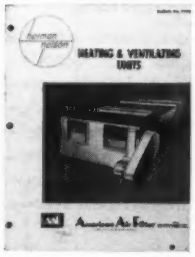
61—Steam Specialties

"Replacement Parts Catalog for Webster Steam Specialties," bulletin S-675J, a perennial favorite with engineers, has recently been revised and brought up-to-date. This bulletin illustrates and describes replacement parts for the entire line of Webster steam specialties with complete ordering instructions. *Warren Webster & Co.*



62—Classroom Air Conditioner

Publication 11-1 presents the new Nesbitt Year-Round Syncretizer — the classroom air conditioner that offers heating, ventilating, natural cooling, dehumidification, and mechanical cooling for maximum year-round comfort. It describes precooling feature that conditions outside air before entering main cooling element. *John J. Nesbitt, Inc.*



63—Heating and Ventilating

Bulletin 775 describes Herman Nelson heating and ventilating units in capacities ranging from 1200 to 15,000 cfm. Details for ceiling, wall, or floor installations included. Shown are steam and hot water capacity charts, fan section capacities, and dimensions. Formulas for figuring heating capacities also given. *American Air Filter Co., Inc.*



64—Gas Boilers

Catalog 718A illustrates and describes the "66" Series gas boiler for large residential, institutional, commercial, and industrial applications. Specifications are shown for 20 boiler sizes. A.G.A. approved boiler ranges in net IBR rating from 1770 to 14,250 sq ft of steam and from 3005 to 22.775 sq ft of water. *National-U. S. Radiator Corp.*



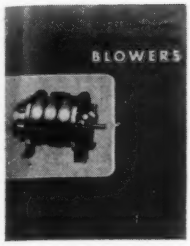
65—Cooling Towers

This four-page catalog describes six new Flow-Cold cooling towers for air conditioning or industrial cooling. Capacity range of the Flow-Cold line is 3 through 20 tons. The fully illustrated catalog offers complete information and provides graphic selection data as well as full dimension drawings for each model. *Acme Industries, Inc.*



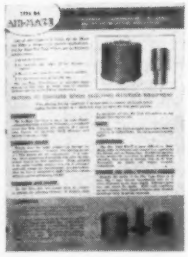
66—Hot Oil Heaters

Brochure RE-342 describes the operation, performance, and product features of hot oil heaters for industrial and commercial applications where low pressure temperatures up to 600 F are needed. Specifications cover the type of fuel, capacity of burners, Btu input and output, and other pertinent details of six standard models. *Bros Inc.*



67—Rotary Positive Blowers

Bulletin AF-154 contains descriptive information and operating data regarding rotary positive blowers of seven inches gear diameter and smaller. These blowers are rated from 1 to 7 psig and will handle from 10 to 700 cfm of air. Included in this bulletin are selection and dimension tables, performance data, drawings. *Roots-Connersville Blower.*



68—Dry Air Filter

Bulletin DA-1056 provides descriptions and engineering specifications on dry-type air filters and filter silencers for application on engines, compressors, blowers, and for other industrial uses, where oil-free air and fine, efficient filtration is required. Capacities of the filters and silencers are from 20 to 6650 cfm. *The Air-Maze Corp.*



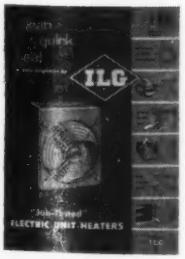
69—Power & Gravity Ventilators

Bulletin D10-58, Penn Ventilator's newly completed catalog, "Powered and Gravity Roof Ventilators and Accessory Products," is now available. The new larger capacity Domex is presented in this issue with accompanying performance tables and dimensional data. All Penn units are outlined in this eight-page folder. *The Penn Ventilator Co.*



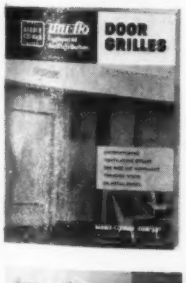
70—Multi-Zone Units

Bulletin C-1100-B98 describes remote central station cabinet type air handling units for multi-zone applications. Bulletin contains complete specifications and application and selection data. Dimensional diagrams and performance charts are included, along with necessary engineering data. Capacities from 4000 to 19,200 cfm. *Worthington Corp.*



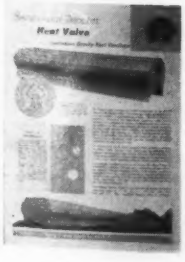
71—Electric Unit Heaters

"Clean, Quick Heat at Your Fingertips," four-page bulletin No. 806, provides simple solutions to difficult heating problems. Detailed specification chart gives dimensions, capacities, and performance data on a complete line of unit heaters, sizes 1½ to 15 kw, capacities 180 to 1000 cfm, 5118 to 51,180 Btu per hr. *Ilg Electric Ventilating Co.*



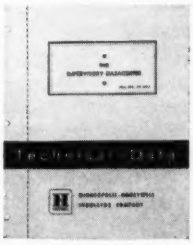
72—Door Grilles

Designed with appearance in mind, Uni-Flo door grilles provide visionproof air distribution while remaining within the bounds of modern decor as illustrated and described in eight-page catalog F 8308. The catalog contains performance data which will permit the sizing of door grilles for most applications. *Barber-Colman Co.*



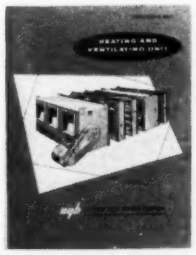
73—Gravity Roof Ventilators

The Swartwout-Dexter heat valve, a continuous gravity roof ventilator, is presented in eight-page bulletin HV-1. A chart shows how the heat valve compares with round ventilators in providing area of ventilating opening. Dimensions, installation drawings, and details of various types of dampers are given. *The Swartwout Co.*



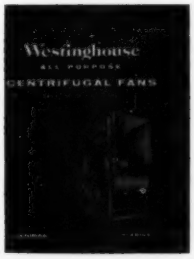
74—Supervisory DataCenter

Technical data bulletin 77-0111 contains information regarding Supervisory DataCenter panels. Panel specifications are given along with complete ordering information. Ten standard modules are sketched as well as a typical Supervisory DataCenter. Each unit is built to customer's specifications. *Minneapolis-Honeywell Regulator Co.*



75—Heating and Ventilating

The Make-Up AIR, using Steelfin coil, now adds to its family a heating and ventilating unit, using Aerofin copper coil. All sections are individually supported, removable for maintenance or replacement. Nine basic blower sections are available, in any rotation. Capacities from 1500 to 30,000 cfm listed in bulletin 567. *New York Blower Co.*



76—Centrifugal Fans

Catalog 1121 details the efficiency and quietness of airfoil blading for all purpose applications in a complete standard line of centrifugal fans, (Series 8000) covering every requirement up to 700,000 cfm . . . and up to 16¾-in. total pressure. Sized to AMCA-NAFM Standards, Classes I-IV. *Westinghouse Electric Corp., Sturtevant Div.*



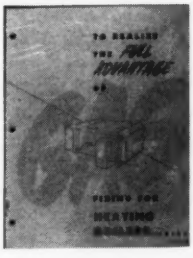
77—Ram Type Underfeed Stokers

Bulletin 203 contains specifications for using Vulcan stokers where capacities up to 3500 lbs of coal per hour for loads up to 800 hp are required. "Synchro" combustion controls automatically adjust fuel-feed, air supply, boiler draft, and combustion rates. "Turbo-Aire" system complies with smoke regulations. *Canton Stoker Corp.*



78—Low Type Fan Ventilators

Bulletin SPV-16 includes complete details on Burt Low Type fan ventilators, high capacity power units low in height, weather-proof, with simple, fast installation. Either direct or V-belt power drive may be used and units are highly efficient either as an exhaust fan ventilator or as a fresh air ventilating unit. *The Burt Manufacturing Co.*



79—Gas Firing

Bulletin B-8 describes the Webster Kinetic gas burner with complete information on how to select burner size, the automatic operating controls, combustion safeguards, and control valve selection. Charts and diagrams illustrate information. Use of Kinetic for conversion of heating boilers is discussed. *Webster Engineering Co.*



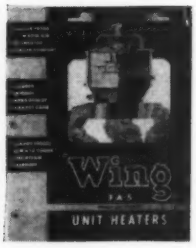
80—Ventilation Systems

This 60-page catalog describes Colt system of ventilation and wide range of equipment available. Since each building presents a different ventilation problem, each operating on the law of diminishing returns, Colt's customized chart instantly gives any engineer the cost of a variety of design solutions. *Colt Ventilation of America, Inc.*



81—Packaged Liquid Chillers

Contained in this 27-page booklet is a wealth of material covering every use of packaged liquid chillers. Also included are engineering specifications, capacity data on chillers and condensers, as well as roughing-in dimensions for various models. Additional pages are devoted to descriptions of features. *Airtemp Div., Chrysler Corp.*



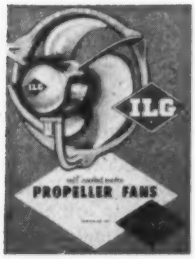
82—Fresh Air Supply Heaters

Bulletin FAS-1 describes a heater for the replacement of air exhausted in manufacturing and for workers' comfort. Outside air is drawn in and heated to exact temperature required. Heating coils, always under full steam pressure, cannot freeze. Two types, one for ceiling or roof, the other for wall or window. *L. J. Wing Mfg. Co.*



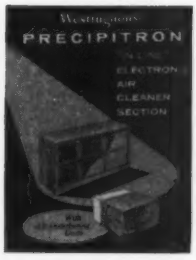
83—Heat Anticipating Control

Bulletin CA 10-1 discusses the use of heat anticipating control to minimize over-shooting of space temperature caused by systems having a large amount of inherent thermal lag. Describes and illustrates the correct application on two- and three-wire valve operators and combination heating-cooling operators. *Barber-Colman Co.*



84—Propeller Fans

Catalog 153, 36 pages, gives descriptions, capacities, dimensions, and performance data on the complete line of Ilg propeller fans, including: industrial and commercial exhaust fans, kitchen ventilators, dark-room ventilators; and penthouses and fan accessories. Direct-drive and self-cooled motor features are detailed. *Ilg Electric Ventilating Co.*



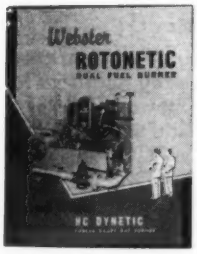
85—Air Cleaner Section

Catalog 1636 details performance and selection data for electronic air cleaner section as an integral "in-line" assembly with air distributing units. Provides over 95 percent air cleaning efficiency at normal coil face velocities for central plant air conditioning, heating, and ventilating . . . up to 28,000 cfm. *Westinghouse Electric Corp., Sturdevant Div.*



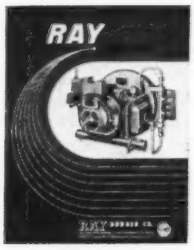
86—Roof Ventilators

A centrifugal roof ventilator aerodynamically designed to exhaust against high resistance and offering flexibility, space-saving, and economy is illustrated and described in Bulletin 565. Capacities and dimensions are included, together with descriptions of propeller-type roof ventilators for lower resistances. *New York Blower Co.*



87—Dual Fuel Burners

Bulletin B-15 describes the Webster Rotonetic dual fuel unit: a low pressure forced draft gas burner and horizontal rotary cup oil burner. Pictures and charts illustrate its construction, operation, control system, dimensional specifications, and capacities. Description also includes HC Dynetic for straight gas. *Webster Engineering Co.*



88—Burners

This new 16-page booklet illustrates and describes Ray Burner equipment for firing oil, gas, or combination oil or gas: manual, semi-automatic, and fully automatic models; rotary, pressure atomizing inshot gas, packaged forced draft boiler-burner units. A burner for every domestic, commercial, or industrial need. *Ray Burner Co.*



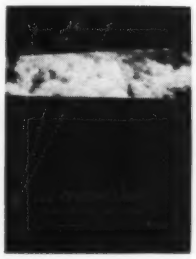
89—Baseboard Heating

Webster baseboard heating bulletin B-1602B completely describes the new Webster Tru-Perimeter forced hot water baseboard heating product line that has been considerably improved during 1957. The bulletin includes a complete product description, together with rating data and suggested specifications. *Warren Webster & Co.*



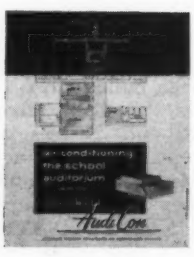
90—Boiler-Burner Units

New Webco-Ray 3-pass packaged boiler-burner units for heating, power, and process steam are featured in this 1958 catalog. Ratings, data and dimensions, installation details, and other specification data are given in this eight-page booklet. Capacities range from 25 to 600 hp. *Western Boiler Co.—Ray Burner Co.*



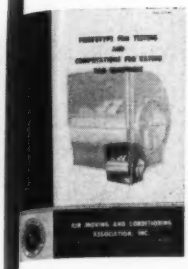
91—Heating Boilers

"How 'Cruising Speed' Serves the Supersonic Age," colorful 12-page booklet 1072, illustrates and describes how Kewanee boilers with built-in "cruising speed" operation solve heating problems in various aircraft companies throughout the United States. Several types of boilers are illustrated. *Kewanee Boiler Div. of American-Standard.*



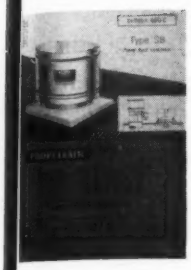
92—Auditorium Air Conditioner

Publication 22-1 describes the AudiCon for quiet operation in school auditoriums, libraries, cafeterias, and administration areas. The unit heats, cools, dehumidifies, and ventilates. 16 models are available — 1250 to 15,000 cfm — 3 to 60 tons cooling capacity — 40,000 to 1,500,000 Btu per hr heating capacity. *John J. Nesbitt, Inc.*



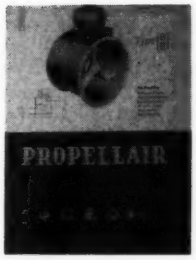
93—Fan Tests

Bulletin 151 tells how production unit fans are tested to determine performance characteristics for a complete series of fans of the same design and geometrically similar proportions, of the same size or larger. It also discusses basic laws of fan performance and deviations from the laws. *Air Moving & Conditioning Association.*



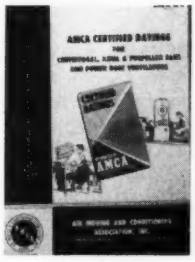
94—Power Roof Ventilator

Bulletin 680-C, eight pages, presents the Type SB Sky-Blast power roof ventilator. It describes and illustrates fans and motors, lists construction features, ratings, specifications, and dimensions. Drawings are given for concrete, wooden, and steel curb construction with a chart of curb dimensions. *Propellair Div., Robbins & Myers, Inc.*



95—Belt Driven Fans

Bulletin 620 illustrates and describes Type BT and BTV belt driven tubeaxial fans for handling corrosive fumes, high temperatures, explosive fumes, abrasive dusts, dirt-laden air, and high humidity. Drawings are given for totally enclosed, corrosion resistant, and ventilated assemblies. A chart gives ratings. *Propellair Div., Robbins & Myers, Inc.*



96—Performance Ratings

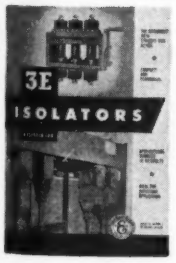
Bulletin 153-57 describes new program enabling specifiers of air moving equipment to identify the brands of products that perform according to stated performance ratings. It illustrates typical test set-ups and performance curves for 7 centrifugal, axial, propeller fans, and power roof ventilators. *Air Moving & Conditioning Association.*

ELECTRICAL EQUIPMENT



97—Motor Starters

EC&M Type ZHS motor starters for 2200- to 5000-v squirrel cage, wound-rotor, and synchronous motors are illustrated and described in booklet 1062. Units are available for full voltage, part winding, or reduced voltage starting, reversing or nonreversing service. *Electric Controller & Mfg. Co., Div. of Square D Co.*



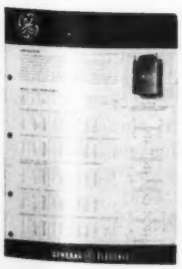
98—Disconnectors

Bulletin 140, 36 pages, describes 3E Isolators for disconnecting equipment and cables, in ratings up to 15,000 v and 1200 amp. It lists points to be considered when ordering, shows the units in typical applications, and gives dimensional drawings, cutaways, and specifications for the various types. *Electrical Engineers Equipment Co.*



99—Control Centers

Catalog SM-244, 16 pages, describes in detail the modern method for centralizing electrical power distribution and motor control equipment for industrial applications. It also contains suggested ideas for control specifications, and gives a simplified selector for use in control center layout and planning. *Square D Company.*



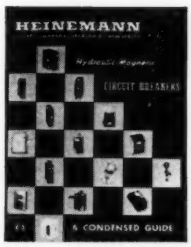
100—Quiet Transformers

Dry-type specialty transformers for commercial building application, designed for a noise level of 45 decibels or below, are described and illustrated in bulletin GEC-1432. Prices, dimensions, applications, and wiring diagrams are given for single and three-phase transformers for indoor and outdoor use. *General Electric Co.*



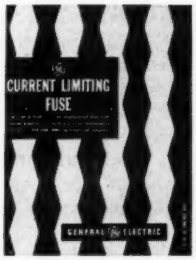
101—Cable Fittings

"O.Z. Terminating and Splicing Fittings for Interlocked Armor Cable," 36-page engineering bulletin 135A, gives complete specifications, dimensions, cutaway drawings, photographs, and installation instructions. Prices and weights also are given for each item, along with ordering data, and available materials. *O.Z. Electrical Mfg. Co.*



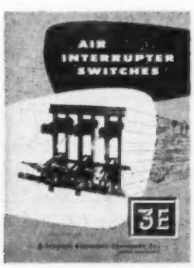
102—Circuit Breakers

Bulletin 301, 16 pages, describes operation and application of Heinemann hydraulic-magnetic circuit breakers. It lists a complete line of 1-, 2-, and 3-pole breakers; gives standard current ratings (0.010 to 100 amps); shows time delay characteristics for branch and motor control circuits; and has UL listings. *Heinemann Electric Co.*



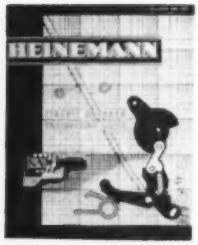
103—Current-Limiting Fuses

The General Electric CLF high interrupting capacity, current-limiting fuse primarily designed for application on low voltage circuits where the available short circuit currents exceed values that conventional NEC fuses can interrupt successfully are illustrated and described in eight-page bulletin GEA-6319C. *General Electric Co.*



104—Air Interrupter Switches

Bulletin 152 lists and illustrates a complete line of dry-type and liquid-filled switches through 14.4 kv. Units offer Auto-Speed interruption and automatically produced interruption that occur at the same point in the switching operation and take ½ cycle. Ratings, dimensions, and specifications are given. *Electrical Engineers Equipment Co.*



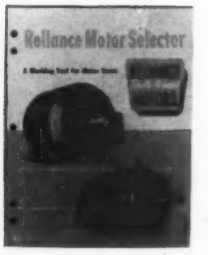
105—Hydraulic-Magnetic Breakers

Bulletin 201, 22-page engineering guide, covers application of Heinemann hydraulic-magnetic circuit breakers. It explains how they provide inverse time delay plus high speed short circuit interruption, and gives time delay curves for motor control, general lighting, and special circuits. It lists rated capacities. *Heinemann Electric Co.*



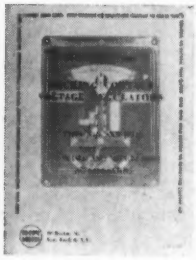
106—Electrical Connections

Completely new 104-page electrical connection catalog covers exothermic method of welding copper to copper or steel without an outside source of heat. All types of connections for cable, ground rod, cable to steel surface, cable to bus bar and tube, bus bar single or multiple, tubular bus bar, and studs are illustrated. *Erico Products, Inc.*



107—Motor Selector

Twelve-page booklet B-2103-2 gives wealth of valuable information for any industrial a-c motor user. Included are NEMA design classes, torque characteristics, speed-frequency relationship, current-torque selection table, frame selection table, and specifications for motors in frame sizes from 182 to 6085. *Reliance Electric and Engineering Co.*



108—Voltage Regulators

Types JS1/1 and JSG1/1 rocking contact voltage regulators for small and medium-sized a-c generators are described in 14-page bulletin P 08-3090. Connection diagram, outline and mounting drawing, and application chart are given. The booklet is indexed for easy reference and carries complete specifications. *Brown Boveri Corp.*



109—Corrosion-Proof Motors

"Corrosion-Proof, From Core to Cover," eight-page bulletin B-2406, outlines the special construction features of Reliance Electric corrosion-proof motors, 1 through 150 hp, 2 or 3 phase, 60 cycle, 220 through 2300 v. Protection of all internal mechanical and electrical parts is pointed out by means of drawings. *Reliance Electric and Engineering Co.*



110—Paper-Lead Power Cable

Publication C-89 provides thorough information about Anaconda Type CB paper cable and F-3 alloy sheath. The patented carbon-black-tape feature is described, in addition to important operating characteristics and engineering test results. Complete treatment is given to F-3 alloy-lead sheath, also patented. *Anaconda Wire & Cable Co.*



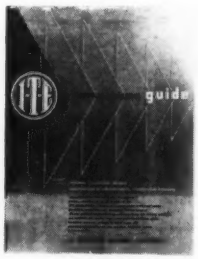
111—Air-Break Starters

EC&M Type ZHA air-break starters (2200-4800 volts) for squirrel cage synchronous, and wound-rotor motors are presented in bulletin 8130-SCI. Starters are designed to withstand 60 kv impulse test on 4800-v starters; 45 kv on 2300-v starters. Line of oil-break starters is shown. *Electric Controller & Mfg. Co., Div. of Square D Co.*



112—Diesel Engines

Operational phases of the Fairbanks-Morse opposed piston diesel engine are demonstrated graphically in this brochure by means of a three dimensional cutaway working model of an engine. With color, it shows the location and use of lube oil, scavenging air, fresh water, fuel oil, and exhaust gas. *Fairbanks, Morse & Co.*



113—Products Guide

This 16-page bulletin contains descriptive data on major products manufactured by I-T-E, such as: power switching equipment, metal-enclosed bus, metal-clad and low voltage metal-enclosed switchgear, unit substations, air circuit breakers, network analyzers, mechanical rectifiers, and porcelain insulators. *I-T-E Circuit Breaker Co.*



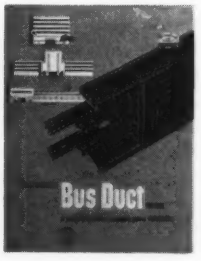
114—Electrical Machinery

"Catechism of Electrical Machinery," 48-page bulletin E100M, presents the most important theoretical and practical features of the common types of d-c and a-c motors, generators, and control equipment. Text is illustrated with Fairbanks-Morse machinery with explanation of operation and construction. *Fairbanks, Morse & Co.*



115—Electrified Concrete Floors

This 32-page manual was written specifically for structural and electrical engineers. It describes how precast fire-resistant Flexicore concrete floors are used for low rise and high rise buildings, and how the hollow cells in the floor are used for the installation of underfloor electrical distribution. *The Flexicore Co., Inc.*



116—Bus Duct Manual

"Bus Duct Manual," 72-page bulletin B-4272B, is designed for consultants' use in planning and selection of units for bus duct layout in commercial, institutional, and industrial buildings. Plug-in duct, weather-proof feeder duct, low-impedance duct, and weather-proof low-impedance duct are fully covered. *Westinghouse Electric Corp.*



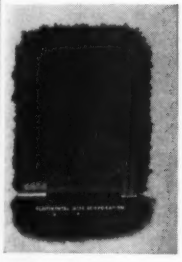
117—Manufacturing Facilities

"The Four Minute Tour" is a word and picture trip through the facilities and offices of Continental Wire. It points out some of the machines and operations used to make insulated wire and cable: taping heads, extruder, winder, braiding machinery, carders, varnishing towers, and types of inspection at each point. *Continental Wire Corp.*



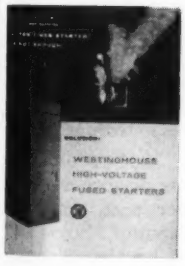
118—High Voltage Insulation

Exceptional characteristics of Anaconda Type AB butyl-rubber insulation in high-voltage applications are highlighted in engineering bulletin EB-27, 12 pages. It details results of tests in which Type AB compound demonstrated unusual ozone resistance, long aging performance, and good power factor stability. *Anaconda Wire & Cable Co.*



119—Wire and Cable

"Wire & Cable for American Industry," 72-page catalog, gives construction specifications for all types of wire and cable, such as: apparatus, appliance, audio, boiler room, building, coaxial, control, gasoline resistant, instrument, mining, power, railway signal, remote control, street lighting, and many other types. *Continental Wire Corp.*



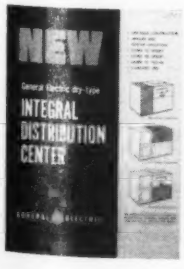
120—Fused Starters

"For industrial high-voltage systems a 'ten times starter' is not enough," according to 12-page booklet B-6535. It tells how high-voltage, fused starters give protection to the system, personnel, and motors. Horsepower ratings and representative types of starters available for a-c motors are listed. *Westinghouse Electric Corp.*



121—Package Unit Substations

Eight-page bulletin covering package unit substations explains the advantages that substations offer when used in modern electrical systems. It shows a complete line of Square D equipment that has been designed to meet the needs imposed by modern systems, both high voltage and low voltage. *Square D Company.*



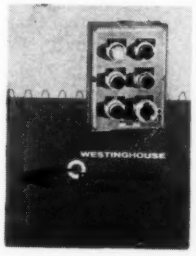
122—Distribution Centers

New 16-page illustrated bulletin, GEA-6619, gives complete details on General Electric's new dry-type integral distribution centers, tells how one-piece construction saves space, simplifies specifying, ordering, and installation. Model numbers, dimensions, and choice of incoming line components are given. *General Electric Co.*



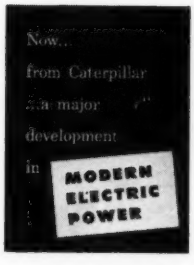
123—Industrial Wired Television

Bulletin 2140 describes Model 500 closed circuit television camera system . . . compact and complete for industrial use. Camera is self adjusting to compensate for wide variations in scene brightness. Weatherproof housings available for outdoor use. Picture viewed on UtiliVue monitor or TV receiver. *Diamond Power Speciality Corp.*



124—Pushbutton Guide

Bulletin B-6749 is a complete 76-page guide containing illustrations, application data, dimensions, and prices of a complete line of industrial pushbuttons. Whether the application calls for standard duty, heavy duty, Oil-tite, or special service control stations, this easy-to-read catalog will give the answer. *Westinghouse Electric Corp.*



125—Modern Electric Power

Form 31649 describes a major development in Caterpillar generators. The new generators in sizes up to 350 kw combine the features of both self-regulated and externally-regulated generators. Easily paralleled with other units, they are compact, provide close voltage regulation, and require no operating adjustments. *Caterpillar Tractor Co.*



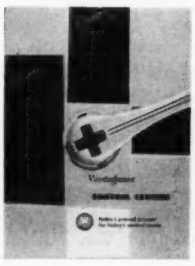
126—Non-Metallic Cables

This bulletin reviews tested "in use" properties and suggested applications of Type RR rubber insulated neoprene sheathed non-metallic cables. Discussed are Type USE 600-v underground service cable, type RH-RW 600-v duct cables, type RHW 600-v duct cables, Nepcozone Flexlay high voltage cable. *National Electrical Products Corp.*



127—Dry Type Transformers

"Engineering Data on Sound Levels of Dry-Type Transformers" compares various noises with decibel readings. It has a chart comparing decibel readings with percentage of noise reduction and gives NEMA standards of various types and sizes of transformers and the decibel rating of Sorgel dry-type transformers. *Sorgel Electric Co.*



128—Control Centers

"Westinghouse Control Centers," 32-page bulletin, analyzes advantages gained with control centers in small shops with a few motors, office buildings, stores, power plants, and in large industries. Charts and tables are included to help you select the proper control center arrangement for the job. *Westinghouse Electric Corp.*



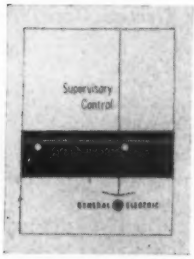
129—Dry Type Transformers

Bulletin 100 contains, in table form, complete statistical information on Hevi-Duty single phase, dry type, insulating transformers, .050 to 500 kva, for power and lighting circuits. Photographs, dimension drawings, capacities, prices, temperature rise, weights and dimensions are given for each transformer listed. *Hevi-Duty Electric Co.*



130—Power Raceway

Bulletin 1254, "Flexibility for Industrial and Commercial Electrical Wiring Systems," describes Walker Power Raceway for underfloor electrical distribution in industrial and commercial buildings. Component parts listed include duct, junction boxes, elbows, supports, and adapters required for future expansion. *Walker Brothers*



131—Supervisory Control

Bulletin GEA-6603 discusses the application, design, and construction of supervisory control equipment. An all-relay, space-code selector system with automatic check-back, this equipment operates over a single communications channel, and may be applied where direct-wire control was formerly deemed necessary. *General Electric Co.*



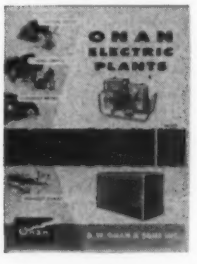
132—Plug-In Circuit Breakers

Catalog 1-106-A features STABREAKER, the new plug-in AB circuit breaker for lighting and power distribution panelboards. Directions are given on how to select components for STABREAKER distribution panelboards. Panel capacities and dimensions, knockout data for top and bottom, and application data are given. *Federal Pacific Electric Co.*



133—Relays

Catalog 57-S4, "ASCO Relays," gives technical information and selection tables for a varied line of both magnetically held and mechanically held relays featuring design flexibility. Standard catalog items include relays up to 24 poles; normally open or closed 10 and 25 amps, ac and dc, plus special purpose relays. *Automatic Switch Co.*



134—Electric Generators

Eight-page three-color catalog describing the complete line of Onan electric generating plants is carefully designed to make it easy for the reader to select the proper type of generating plant and necessary accessories with a minimum of effort. Detailed "Model Selection Guide" gives complete descriptions. *D. W. Onan & Sons, Inc.*



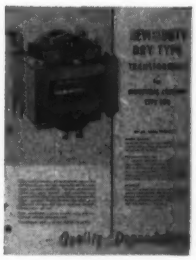
135—Transformers

Twelve-page bulletin 9004-B emphasizes construction details incorporated in both dry and liquid filled transformers. Many photos of typical arrangements, specifications, construction details, and installations are given in this bulletin, which covers transformers with ratings from 112.5 through 3000 kva. *I-T-E Circuit Breaker Co.*



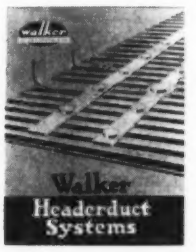
136—Heavy Duty Cat Diesels

Form 717-32489-DE710 illustrates the complete line of Caterpillar diesel engines. Each model is listed with specifications and arrangements available. Ranging in size from 65 hp up to 6[illegible] hp, Cat diesels are offered as original or replacement power for excavators, cranes, crushers, welders, and electric sets. *Caterpillar Tractor Co.*



137—Transformers

Bulletin 300 contains complete information about the Hevi-Duty control circuit transformers. Regulation curves for selecting the proper transformer size are given along with wiring diagrams, dimension drawings, weights and dimensions, ordering information, a table of impedances, and load power factor. *Hevi-Duty Electric Co.*



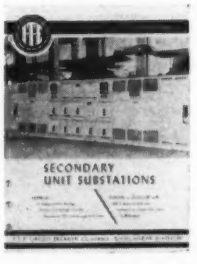
138—Electrical Distribution

Catalog H-1256 describes and illustrates Walker Headerduct electrical distribution system and component parts required to electrify cellular steel deck. Various types of service fittings are included, as well as typical specifications and suggestions for installing a Walker Headerduct system, with dimension drawings. *Walker Brothers.*



139—Silicone Insulated Motors

Case histories describing how increased reliability and greater overload capacity were achieved by applying silicone insulated motors are detailed in six-page brochure 10-104. Applications ranging from small integral horsepower motors on processing lines through large power plant auxiliary drives are evaluated. *Dow Corning Corp.*



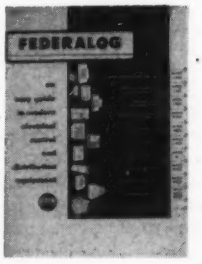
140—Secondary Unit Substations

Twenty-page bulletin 9004-A on secondary unit substations describes many features such as lower cost, complete flexibility, and space saving. Photos and charts of construction and application details are furnished for units with standard kva ratings covering all types of indoor and outdoor substations. *I-T-E Circuit Breaker Co.*



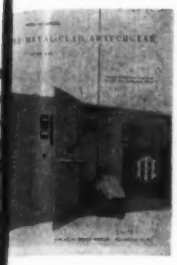
141—Grounding Devices

A complete new line of 3-wire, 15-amp, 125-v "Twist-Lock" devices for grounding purposes only, known as the 4700 Series "Twist-Lock," are non-interchangeable with regular "Twist-Lock" of the 7580 type. A special elbow-shaped grounding slot positively prevents entrance of regular "Twist-Lock" type caps. *Harvey Hubbell, Inc.*



142—Electrical Equipment Guide

Catalog 110 is an easy guide to modern electrical control and distribution equipment. It includes, drawings, specifications, dimensions, and other pertinent engineering data on circuit breakers, panelboards, safety switches, industrial motor controls, bus and trolley duct, switchboards and switchgear. *Federal Pacific Electric Co.*



143—Switchgear

Twenty-four page bulletin 7004C covers indoor and outdoor switchgear. Comprehensive drawings and charts are designed to assist you in planning. Rated 7.5 and 15 kv through 200 amps continuous and 750 mva interrupting. Bulletin shows convenient arrangements for control and auxiliary equipment. *I-T-E Circuit Breaker Co.*



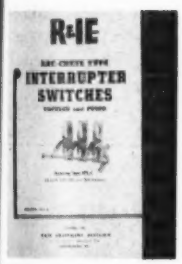
144—Grounding Devices

The new Hubbell 4700 Series line is the "Twist-Lock" equivalent of the 5262 line of straight blade grounding devices. Just as the 5262 line can be quickly identified by the U-shaped grounding slot, the new 4700 Series units are identified positively by the elbow-shaped grounding slot. *Harvey Hubbell, Inc.*



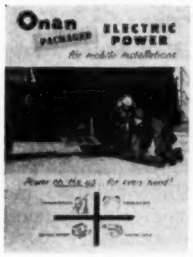
145—Motor Starters

Size 4, 5, and 6 starters and contactors for motors from 50 to 400 hp are described in 12-page bulletin 14B8615. A complete line of across-the-line, reduced-voltage and combination starters is listed. One section discusses arc centering blowout — a system using thermal convection and magnetic action. *Allis-Chalmers Mfg. Co.*



146—Interrupter Switches

Bulletin 1610A, 24 pages, describes and illustrates arc-chute type interrupter switches, fused and unfused, for switching feeder circuits. Usually metal enclosed, the switch can be wall mounted, free standing, or grouped with common bus. Switches can close in on moderate faults. *R & IE Equipment Div., I-T-E Circuit Breaker Co.*



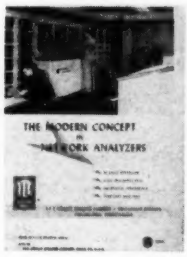
147—Mobile Electric Power

"Packaged Electric Power for Mobile Use," eight-page folder, describes three different Onan power systems for mobile installations. System #1 describes use of Onan plant for battery charging and a-c power; #2 describes certain Onan plants with high battery charging output; #3, Onan plants for battery charging only. *D. W. Onan & Sons, Inc.*



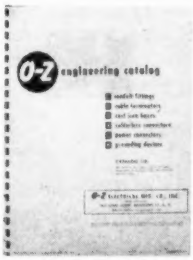
148—Bus Conductor Handbook

280-page handbook presents facts and figures vital to anyone responsible for engineering of bus installations. Contains 69 graphs, tables, and photographs, presenting essential information in easy-to-read, readily usable form. Shapes, design, reactance, capacities, deflections, joints, and installation are covered. *Aluminum Company of America.*



149—Network Analyzers

"The Modern Concept in Network Analyzers," eight-page bulletin 4004-A, incorporates descriptive and operating information on I-T-E network analyzers, suited to handle such power system problems as load flow, short-circuits, and transient or steady-state stability. Rental is discussed. *I-T-E Circuit Breaker Co., Switchgear Division.*



150—Electrical Fittings

Loose-leaf catalog 135 has been prepared to provide all the technical information you need to select the right conduit fittings, cable terminators, cast iron boxes, and solderless connectors for each of your electrical installations. It includes a comprehensive index and a section of useful engineering data. *O.Z. Electrical Mfg. Co.*

HEAT EXCHANGERS AND WATER HEATERS



151—Convertor Rating Tables

Bulletin 62, 16 pages, has been designed in answer to the need for convertor rating tables that are accurate and arranged for rapid and easy reading. At least three Type R U-tube convertor sizes are listed for each set of operating conditions, depending on pressure drop limitations. Booklet is indexed for quick reference. *Whitlock Mfg. Co.*



152—Preheater for Small Boilers

The important points to consider in selecting a preheater for use with small boilers (25,000 to 125,000 lbs per hr) are discussed in four-page bulletin on the new package Ljungstrom air preheater. How use of a preheater saves fuel, increases boiler output and reliability, and permits use of lower grade fuels is explained. *Air Preheater Corp.*



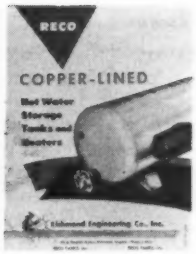
153—High Pressure Closures

Bulletin 5.6K1, four pages, describes high pressure closures for Ross feedwater heaters and other high pressure, high temperature exchangers. Design details are illustrated by photos and cross sections. Text discusses simplicity of design, safety factor, and ease of removal. *Ross Heat Exchanger Div. of American-Standard.*



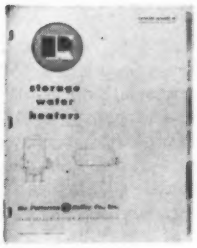
154—Storage Heaters

Bulletin 40B, 16 pages, has been written to facilitate selection of Type K storage heaters for conditions normally found in buildings of various classifications. Typical layouts are included along with tables of pressure thickness, vertical and horizontal storage heater dimensions, and capacities. *Whitlock Mfg. Co.*



155—Hot Water Storage

"Reco Copper-Lined Hot Water Storage Tanks and Heaters," four-page folder 513, gives specifications, special construction details, and cutaway drawings of steel-shelled, horizontal and vertical copper-lined tanks and heaters. It discusses briefly the full line of fabricated heat exchange equipment. *Richmond Engineering Co., Inc.*



156—Storage Water Heaters

"Storage Water Heaters," 48-page catalog 19, gives construction details, storage and heating capacities, dimension tables, and standard specifications for steel, copper-lined, copper silicon, cement-lined, clad-galvanized, and Lo-Flo storage water heaters. Typical piping diagrams are included for easy reference. *Patterson-Kelley Co., Inc.*



157—Heat Exchangers

"Standard Heat Exchangers for Process Industries," 20-page bulletin M-306 spotlights the outstanding features of these units. Sizes and dimensions, surface areas, film coefficients, and characteristics of tubing are presented, along with a graph showing effect of fouling factors on over-all heat transfer rates. *Yuba Consolidated Industries, Inc.*



158—Corrosion Resistant Linings

"Special Corrosion Resistant Linings for Hot Water Storage Tanks and Heaters," four-page folder 514, describes plastic coatings and linings, cement linings, clad steel, and galvanizing for hot water storage tanks and heaters. Suggested uses for each type of lining are listed with advantages. *Richmond Engineering Co., Inc.*

HIGHWAYS, BRIDGES AND STREETS



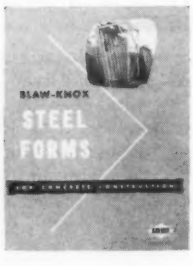
159—Construction Products

This 54-page manual describes and illustrates 23 Armco products for engineering construction. Among them are corrugated metal pipe, pipe-arch, asbestos-bonded pipe, Smooth-Flo sewer pipe, Hel-Cor pipe, perforated pipe, and multi-plate pipe. Included is a section on Armco construction services. *Armco Drainage & Metal Products, Inc.*



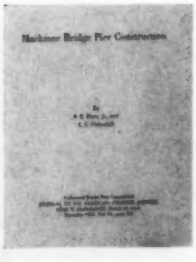
160—Bridge Flooring

Irving decking catalog F-300 contains illustrations, descriptions, and engineering data on open metal grid bridge roadways, with many of the advantages inherent in this type of bridge roadway, such as lightweight, cleanliness, drainage, safety, durability, strength, traction, and economies. *The Irving Subway Grating Co., Inc.*



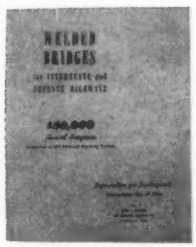
161—Steel Forms

Bulletin 2430 features heavy steel forms for concrete construction. Illustrated are a few of the many major construction projects on which Blaw-Knox heavy forms have been used. Included is important information on all data that should be included with inquiries on steel forms, with practical design suggestions. *Blaw-Knox Co.*



162—Mackinac Bridge

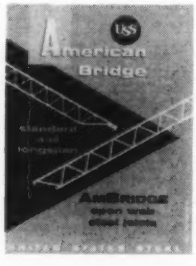
Recent opening of the hundred million dollar Mackinac Bridge makes this detailed report on underwater concrete placement timely. Article explains ingenious methods required to overcome weather and water hazards and place some 450,000 cu yds of concrete. Two of the 34 piers were founded 200 feet below surface. *Intrusion-Prepakt, Inc.*



163—$50,000 Bridge Design Awards

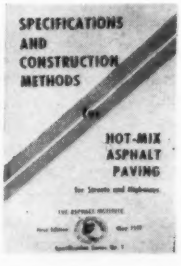
Brochure describes a competition being sponsored by The James F. Lincoln Arc Welding Foundation offering 16 awards for the best designs for welded highway bridges. Top award is $10,000. Any bridge meeting the award specifications, either built, under contract, proposed or theoretical is eligible. *The James F. Lincoln Arc Welding Foundation.*

To order personal copies of these bulletins, please fill out the card between pages 4 and 5 or 36 and 37.



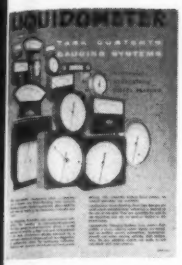
164—Steel Joists

This 40-page steel joist catalog contains complete design information for spans up to 120 ft. It covers in detail design calculation, bridging, end details, and accessories. Complete tables of properties and dimensions, standard loading, and design load, and marking system for ordering are given. *American Bridge Div., United States Steel.*



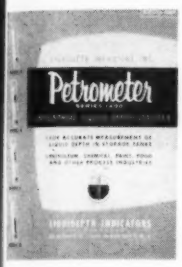
165—Hot Mix Asphalt Paving

"Specifications and Construction Methods for Hot-Mix Asphalt Paving" (Specification Series No. 1) brings together all recognized and proven types of hot-mix asphalt paving. By following this 96-page booklet, the engineer can prepare specifications that include physical dimension, quality, and financial investment. *The Asphalt Institute*



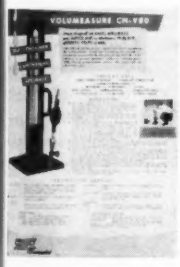
166—Tank Contents Gaging

Suggested specifications for tank contents gaging systems — hydraulic, hydrostatic, and direct reading—are given in bulletin 463A. Model selection guides and pictorial diagrams are included, along with a list of liquids successfully gaged by Liquidometer systems, and principles of operation of each gage. *The Liquidometer Corp.*



167—Industrial Tank Gages

Bulletin 6004 describes a new line of remote reading industrial liquid depth gages. It presents comprehensive information on operation and design of the Petrometer Series 1400 Gauges, as well as on the method of selecting the right gage for remote indication of depth or quantity of liquids in tanks and pressure vessels. *Petrometer Corp.*



168—Density Tester

Bulletin CN-980 contains complete information on the new Volumeasure, a self-contained, lightweight, and accurate unit designed for fast and simple field or laboratory in-place density tests of soils. The unit provides a positive test method for use in embankment control and subgrade compaction projects. *Soiltest, Inc.*



169—Liquid Level Alarms

A series of four Levalarms, liquid level alarms and fuel cut-outs, is described in four-page bulletin D2. The bulletin explains principle of operation — water conduction between electrodes of varying lengths—how the units can be used with relays to provide alarm actuation, fuel cut-out, or pump start-stop control. *The Reliance Gauge Column Co.*



170—Compression Tester

Bulletin AP-350 illustrates and describes the Versa-Tester, a multi-purpose compression testing machine ideal for research or routine laboratory testing. Accurate tests requiring capacities to 30,000 lb can be performed simply and quickly on soils, bituminous materials, mortar, concrete, plastics, metals, and wood. *Soiltest, Inc.*



171—Heating and Cooling Controls

Mercoid automatic controls for heating, refrigeration, air conditioning, and industrial applications are described in 56-page catalog 857. The booklet is completely indexed by subject and catalog number and gives all pertinent engineering data, specifications, dimensions, ranges, and temperature and pressure charts. *The Mercoid Corp.*



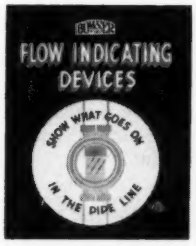
172—Low Cost Computer

A serial, single address, fixed point, binary, stored program digital computer that fulfills the need for a small sized, reliable, and low priced scientific computing device is described in 12-page bulletin RP2B-735. It explains use of the unit in research, applied engineering, and suggests uses in industry. *Royal McBee Corp.*



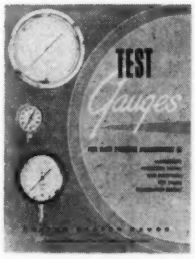
173—Instrument Accessories

Bulletin 600 describes accessories for various types of gages, dial thermometers, and recorders, including attachments for protection of instrument internals against corrosive media and pulsations in pressures. It also shows ring for panel mounting of turret case instruments. *U.S. Gauge Div. of American Machine and Metals, Inc.*



174—Flow Indicators

Bowser flow indicating devices for many industrial in-plant or process systems are illustrated in a broad size range with complete data, including specifications and dimensions for easy reference. Each product is pictured and described with suggested commercial and industrial applications, sizes, and types listed. *Bowser, Inc.*



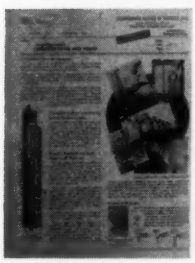
175—Test Gage Catalog

Eight-page bulletin 400 deals with selection of test gages for fluid pressure measurement in laboratories, production testing, field inspections, test stands, and recalibration benches. It provides a list of check points for ordering gages, and suggests applications for each. *U. S. Gauge Div. of American Machine and Metals, Inc.*



176—Liquid Level Indicators

How the Eye-Hye gage helps protect the power plant from liquid level accidents is explained in four-page catalog 500, Sec. CO. A diagram shows the flexibility of placement possible: near boiler, tank, or other vessel, or on instrument panelboard, near by or considerably removed from the boiler. *The Reliance Gauge Column Co.*



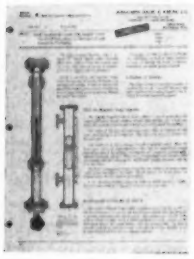
177—Gages and Valves

Eight-page Data Unit No. 305 illustrates and describes Jerguson's line of gages and valves. Materials, sizes, and operational characteristics of Reflex and Transparent Gages are included. A comprehensive working table of standard and optional construction features and dimensional data is given. *Jerguson Gage & Valve Co.*



178—Sight Glass Indicators

OPW Visi-Flo's trustworthy visible means of showing rate of flow, viscosity, color of liquids, clarity and purity of product are outlined in four-page folder F-6. Plain types to magnetic indicating types in cast iron, bronze, aluminum, and monel are illustrated fully. Dimensions are furnished. *OPW Corp., Jordan Industrial Sales Div.*



179—Magnetic Gage

Data Unit No. 306 describes and illustrates the new Jerguson magnetic gage which is designed for gaging liquids under conditions where glass, gaskets, and threads cannot be used due to the high potential danger of explosion or fire if the slightest trace of gas escapes. Dimensions and specifications are given. *Jerguson Gage & Valve Co.*



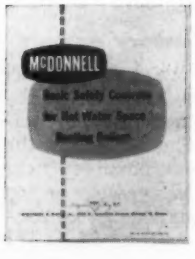
180—Flow Switches

Magnetrol bulletin R-20 explains operating principle and gives application data for Magnetrol flow switches. "Rate of Flow" charts aid in selection of proper unit. Design utilizes rate of flow of liquid through standard globe valve body to actuate magnetically a mercury switch, micro switch, or pneumatic pilot mechanism. *Magnetrol, Inc.*



181—Clock and Program Systems

Bulletin CL-640 deals with automatic clock systems and program instrument. Simple operation of the program instrument with or without the clock system is explained. Clock systems include switch reset and automatic reset types for control of 100 or more clocks in schools, institutions, or industrial plants. *Edwards Company, Inc.*



182—Basic Safety Controls

Bulletin P-30 gets down to brass tacks, wastes no words on product description. Uses colored diagrams to tell the story of where, why, and how to install pressure relief valves, low water cut-offs, and boiler waterfeeders. (Companion to similar bulletin L-711, on low pressure steam boilers: see p. 17.) *McDonnell & Miller, Inc.*



183—Remote Operated Recorders

Bulletin P15 describes Stevens position motor type remote registering systems for transmitting, graphic recording and/or indicating water levels, liquid flow, gate position, or positions of any moving body. Generally used over distances of one mile or less. Operates on ac over five-wire transmission line. *Leupold and Stevens Instruments, Inc.*



184—Valve Controls

Bulletin 4-57 fully describes type S LimiTorque valve control with pre-s compensating springs that assure tig valve seat during fluctuation of hig line temperatures. Complete specifica tions are listed for five stock model with features, dimensions, rating mounting positions, and operationa data. *Philadelphia Gear Works, Inc.*



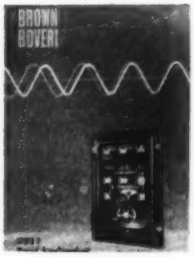
185—Liquid Level Controls

Catalog Section VI gives complete specifications, ratings, and dimensions o Magnetrol's line of external float gage liquid level controls for higher pressures and temperatures: standard units for pressures to 5000 psi and special units for higher pressures. Equipped with mercury or micro switches or pneumatic pilot. *Magnetrol, Inc.*



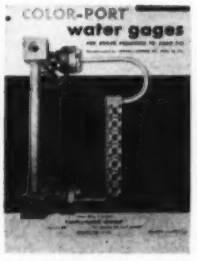
186—Magnetic Flowmeters

Catalog 10D1416 describes a new, obstructionless flowmeter based on magnetic principles that is unaffected by operating conditions and measures with a high degree of accuracy even the most difficult fluids, including slurries or those of a corrosive nature. F&P supplies auxiliary instruments for use with the magnetic meter. *Fischer & Porter Co.*



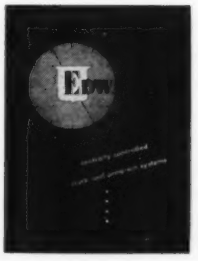
187—Automatic Synchronizer

Bulletin 2035 E deals with the first fully automatic instant synchronizer, Type F, for fast, automatic speed-matching and synchronizing. Use in power stations or substations is discussed. Method of operation and technical data are included along with an explanation of advantages over other units. *Brown Boveri Corp.*



188—High Pressure Gages

The Yarway Color-Port water gage for boiler pressures to 3000 psi is described completely in latest six-page bulletin WG-1814(57). Bulletin explains operation of the easy-to-see color ports with long-life, low-maintenance features. Typical mirror hook-ups shown for quick eye-level reading from operating floor. *Yarnall-Waring Co.*



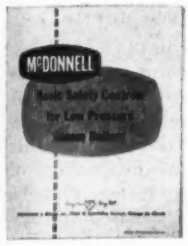
189—Clock and Program Systems

Bulletin CL 572 deals with centrally controlled clock and program systems that are particularly well suited for schools, colleges, institutions, public buildings, and the timing of assembly lines and processes in industry. Clock systems include switch and automatic reset types. Single and multiple circuits are shown. *Edwards Company, Inc.*



190—Electronic Computer

The Royal precision electronic computer (LGP-30), a general purpose electronic digital computer of small size, low cost, large memory, and simplified programming, is presented in bulletin S-525. A command table is given along with data on operation times, type, input-output, power, drum, and circuit cards. *Royal McBee Corp.*



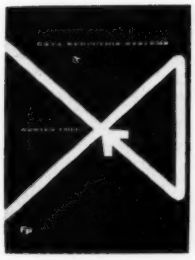
191—Boiler Safety Controls

Bulletin L-711 is not a product catalog, but a basic "why" and "how" booklet on the subject of boiler safety and automatic water level control. Diagrams all types of low pressure boiler systems, discusses proper safety controls, and installation for each. (Companion to hot water boilers bulletin P-30: see p. 16.) *McDonnell & Miller, Inc.*



192—Water Level Telemeter

Bulletin 22 describes the use of the Stevens Telemark for reporting water levels or other moving elements by telephone or radio. Positioning of the measuring and coding element of the Telemark is mechanical while signalling is accomplished with dry cell battery operated motor. *Leupold and Stevens Instruments, Inc.*



193—Data Reduction System

Catalog 30A1200 describes Series 1200 industrial data logger and alarm scanner which accepts combinations of 200 or 2000 varied inputs, depending upon the scanning method used. Abnormal values are logged in a second color and actuate an alarm. Modular "plug-in" construction and "pinboard" programming are featured. *Fischer & Porter Co.*



194—Remote Indicators

Yarway fully compensated remote water level indicators for low, intermediate, and high pressure boilers are described and illustrated in six-page bulletin WG1824 — Supplement A. Bulletin gives detailed explanation of how indicators combine temperature compensation with correction for water density. *Yarnall-Waring Co.*

To order personal copies of these bulletins, please fill out the card between pages 4 and 5 or 36 and 37.

INSULATION



195—Exploded Silica Insulation

Eight-page booklet IN-155A gives details, conductivity data, tables on Fibrocel for hot and cold water, steam, and dual service lines. Material is thermally efficient for 35 to 300 F, will not shrink, swell, or rot, resists deformation, is flameproof, and can be applied quickly. It is available in three jacket styles. *Johns-Manville.*



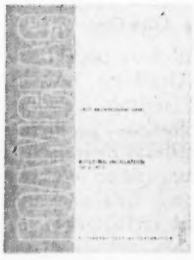
196—Underground Pipe Insulation

Four-page illustrated brochure discusses the problems of underground pipe insulation and explains how Gilsulate's special properties overcome them. On-the-job photos illustrate ease and speed of application. Thermal coefficients of transmission and other technical data and specifications are given. *American Gilsonite Co.*



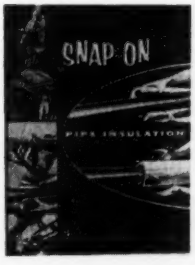
197—Foamglas Insulation

This set of six booklets covers the application of Foamglas insulation for use on low, medium, and high temperature industrial equipment and piping. Each booklet contains tables of suggested thicknesses of insulation to be applied, detail drawings of installation procedure, and insulation supports. *Pittsburgh Corning Corp.*



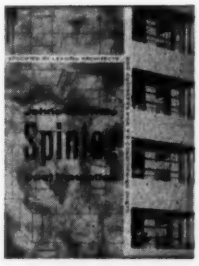
198—Building Insulation

The 1957 edition of the 24-page booklet "Foamglas Building Insulation" is intended as both catalog and reference manual. It contains complete data on the latest recommended procedures for application of Foamglas cellular insulation on flat roofs, pitched roofs, parking decks, curtain walls, and perimeters. *Pittsburgh Corning Corp.*



199—Pipe Insulation

"Snap*On Pipe Insulation," eight-page booklet, describes characteristics and application data for one piece, fineglass pipe insulation. Application specifications cover: plumbing, heating, insulation of valves and fittings, cold piping, and dual temperature outdoor piping. Charts show recommended thicknesses. *Gustin-Bacon Mfg. Co.*



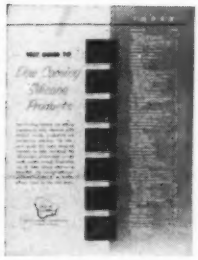
200—Spun Fiber Insulation

Six-page folder IN-177A illustrates, describes, and provides application and specification data on Spintex, a super springy insulation for air conditioning ducts. It has high insulating value, is noncombustible, easy to apply, nonabsorptive, noncorrosive to structural materials, will not rot or mildew. *Johns-Manville.*



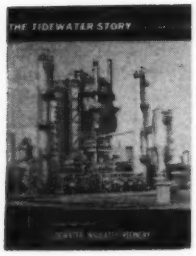
201—One Block Insulation

Mono-Block and Super Powerhouse Brochure gives complete technical information on Baldwin-Hill's Mono-Block the one block insulation that is effective over the full temperature range to 1700 F. Also fully described is a companion product, Baldwin-Hill's one coat Super Powerhouse insulating-finishing cement. *Baldwin-Hill Co.*



202—Insulation Products

Over fifty silicone products, including electrical insulation, are described in 12-page brochure 1-112. Included are high temperature paints and masonry water repellents; silicone lubricants for extremely high and low temperatures. Advantages obtained by specifying silicone insulated motors and transformers are also detailed. *Dow Corning Corp.*



203—Cement Insulation

"The Tidewater Story" describes the planning, specifications, and methods of installation of the Baldwin-Hill Mono-Block and Super Powerhouse cement insulation at the Tidewater Oil Company's new Delaware Refinery. Step-by-step progress photographs demonstrate application of this economical insulation. *Baldwin-Hill Co.*



204—Pipe Insulation News

External house organ published quarterly by the manufacturer of Gilsulate insulation for underground hot pipes carries stories and articles dealing with problems of insulating these pipes. This issue (second) contains evaluation of high temperature hot water systems and the place of poured-in-place insulations. *American Gilsonite Co.*

LIGHTING



205—Luminous Ceilings

Eight-page brochure 32a/Luo gives data on seven different types of luminous ceilings, designed to serve any specification or requirement. Line drawings give details. Ceilings listed are: Acusti-Luminus, Corru-Luminus, Magna-Luminus, Modu-Luminus, Luvr-Luminus, Acri-Luminus, Electric-Luminus. *Luminous Ceilings, Inc.*



206—Over-All Ceiling Lighting

This packet of two and four page brochures features the Gratelite Louver Diffuser for over-all ceiling lighting. It includes full installation, performance, and construction data; description of the new Una-Tee suspension system; time-saving estimating tables; and Gratelite ceiling layout information. *Edwin F. Guth Co.*



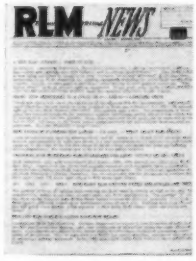
207—RLM Specifications

This new edition of the "RLM Standard Specifications for Industrial Lighting Units" includes newly revised light distribution curves on RLM direct and semi-direct fluorescent lighting units. Most important changes and additions are new coefficient of utilization tables for eight incandescent and fluorescent units. *RLM Standards Institute.*



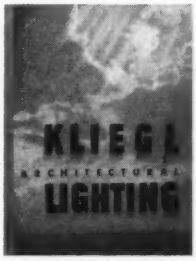
208—Recessed Dome Lighting

Eight-page Quadrilite brochure describes a new concept in recesssed dome incandescent lighting. It shows how diffused wide-area illumination is combined with specific downlight, details design features of units 2- x 2-ft square and 34 inches in diameter, and illustrates how they fit modern ceiling systems. *Lightolier, Inc.*



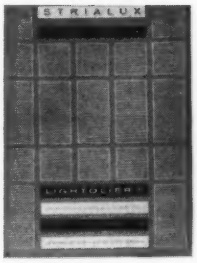
209—Lighting Newsletter

A new RLM service for those interested in industrial lighting is publication of a news letter covering developments in standards, new specifications, and progress reports. Vol. 1, No. 1 covers forthcoming RLM specification for fluorescent units for 800 milliamp lamps and data on efficiency of SD-1 units. *RLM Standards Institute.*



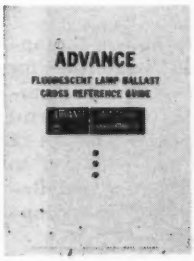
210—Architectural Lighting

Catalog A-11, "Architectural Lighting," presents the latest ideas, fixtures, and special units for commercial, industrial, and home lighting. It includes illustratons, charts, tables of lumens, and other technical data on flush lens units, downlights, picture and accent lighting, wall washers, and similar equipment. *Kliegl Bros.*



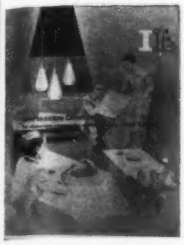
211—Recessed Lighting

New 24-page Strialux brochure details latest in recessed fluorescent lighting. It shows how 2- x 2-ft and 2- x 4-ft modular units of Strialux fit the new suspended ceiling systems, and describes all design features. Detail drawings of new ceiling construction, lighting data, dimensions, and specifications are included. *Lightolier, Inc.*



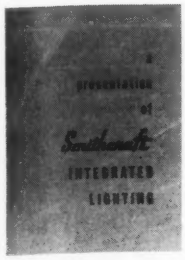
212—Ballast Reference Guide

"Advance Fluorescent Lamp Ballast Cross Reference Guide" is a handy wall chart with comparative data on lamp ballasts manufactured by Advance Transformer and other manufacturers. It matches the catalog numbers of the Advance ballasts and the catalog numbers of other manufacturers' products. *Advance Transformer Co.*



213—Commercial Fixtures

Moe Light's full-color, comprehensive "IL" commercial fixture catalog is illustrated profusely with idea sketches. Over 60 distinctive fixtures are shown for every application: stores, hotels, motels, offices, and institutions. Regular price is $1.00; however, you will be billed only 25c. *Thomas Industries Inc., Moe Light Div.*



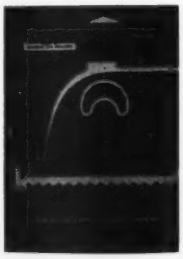
214—Integrated Lighting

This illustrated brochure describes how Smithcraft "Integrated Lighting" improves the environment, utility, and economics of the interior. This system lights the area, incorporates support for movable partitions, corrects acoustics, simplifies installation of air delivery system and sprinklers, and cuts maintenance. *Smithcraft Lighting Div.*



215—Ballast Overheating

General Electric engineers have answered several important questions about fluorescent ballast overheating in this new eight-page bulletin, "Let's Talk About Ballast Heating," GED-3328. The bulletin describes in easy-to-read language the causes, effects, and most important, the solutions to overheating. *General Electric Co.*



216—Industrial Lighting

Bulletin OD-685 contains information about industrial lighting fixtures equipped with the new Power-Groove lamps. Complete specifications are given for four units differing in upward lighting and shielding, along with cross sections, installation drawings, catalog data, and brief descriptions of each type of unit. *Day-Brite Lighting, Inc.*



217—Lighting Large Areas

The LumenArea ceiling system that permits simplified installation with unlimited design possibilities for lighting large areas is presented in bulletin L/A-1. It explains how the system can be used for conventional or abstract, curved or straight ceiling designs in color, without visible screws or supports. *Electro Silv-A-King Corp.*



218—Acoustical-Luminous Ceilings

This 16-page booklet explains in full detail the use of Acusti-Luminus ceiling in offices and stores for control of light, sound, and air flow. It gives table of coefficients of utilization and formulas, describes its use under sprinkler systems (UL approved), and utilization of space above for heating and air conditioning. *Luminous Ceilings, Inc.*

To order personal copies of these bulletins, please fill out the card between pages 4 and 5 or 36 and 37.



219—Commercial Lighting

Bulletin OD-687 introduces a new series of commercial lighting fixtures; the Parawing-2, Parawing-4, Parawing-2 Ultra, and the Paralume for offices, stores, and schools. Apparent shallowness and "box-wing" construction are pointed out. Cross sections, catalog data, and brief descriptions are given of each unit. *Day-Brite Lighting, Inc.*



220—Dual Lighting Fixtures

Combination fixture diffuses conditioned air and provides illumination simultaneously. Adaptable to any drop-type ceiling, it simplifies engineering, contributes to attractive interior design. Air diffuser is located inside the fixture, using the pressure displacement principle, instead of high-velocity injection. *Benjamin Electric Mfg. Co.*



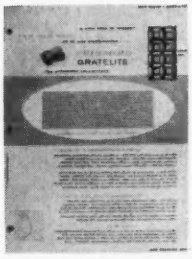
221—Ballast Sound Rating

"A General Electric Report on Ballast Sound," GED-3164, gives an inside story on General Electric's ballast sound rating system. This new eight-page bulletin tells the reasons why it's just as important to specify the sound level as well as the light level of fluorescent lamp installations for a satisfactory result. *General Electric Co.*



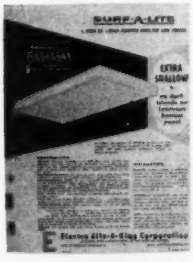
222—Lighting Fixtures

Over 400 fixtures, dozens of room scenes, all in full color, are in Moe Light's 56-page "Heavenly Touch of Light" catalog, which includes high-style and utility fixtures and tells how to achieve dramatic inspiration-lighting in every room of the home plus outdoors. Only 25c. You will be billed. *Thomas Industries Inc., Moe Light Div.*



223—Prismatic Louver Lens

This is a packet of two- and four-page brochures describing the Prismoid-Gratelite, the new prismatic louver lens for lighting fixtures. The bulletins include fixture photographs, light curves, coefficients of utilization, descriptive data, suggested specifications, types of plastics available, and special features. *Edwin F. Guth Co.*



224—Surface Mounted Lighting

Surf-A-Lite, a series of surface mounted units for low ceilings with an arrangement of reflecting surfaces and lamp placement that eliminates the dark islands normally found in shallow units, is described in brochure COM 201-B. Units are available in 12-, 17-, and 24-in. widths, in 2-, 4-, or 8 ft long fixtures. *Electro Silv-A-King Corp.*



225—Theatrical Lighting

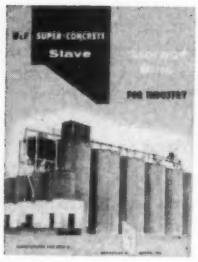
Catalog T-61, completely revised, contains 84 pages of factual information, illumination data, pictures, and diagrams covering the latest lighting and lighting control equipment for use in theatres, auditoriums, and school stages — indispensable information for the lighting specialist and the engineer. *Kliegl Bros.*

MATERIALS HANDLING AND STORAGE



226—Weight Measurement

"Weight . . . Its Measurement and Control," 20-page catalog 12, compares batch-in, batch-out, and continuous weighing processes, and explains how a completely automatic weighing system can be assembled by building block techniques using W & C's Uni-Force weighing components. *Weighing and Control Components, Inc.*



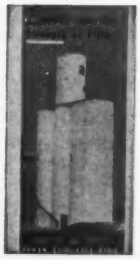
227—Storage Bins

This four-page bulletin describes and illustrates construction of Neff & Fry's Super-Concrete Stave storage bins for industry. Lists of prominent users and varieties of materials are given, as well as tables of capacities in relation to bin diameters, heights, and weights of materials. Concrete roofs are discussed. *Neff & Fry Co.*



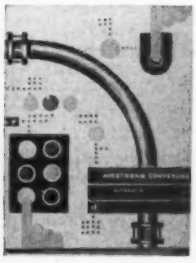
228—Stepless Crane Control

Principles of operation of the new P & H electronic stepless control for overhead traveling cranes are discussed in four-page bulletin C-53. Applied in conjunction with the standard P & H Magnetorque, this control is said to provide an ultimate in control and precision spotting in both lowering and hoisting. *Harnischfeger Corp.*



229—Storage Bins

If you specify vertical storage construction for handling flowable bulk materials, this ten-page foldout will help you visualize how this company's Super-Concrete Stave Storage Bins might meet your requirements. The booklet contains photographs of typical installations, lists uses, and explains construction. *Neff & Fry Co.*



230—Airstream Conveyors

New 32-page bulletin 530, "Airstream Conveyors — the automatic answer to modern bulk handling," contains new data and over 70 illustrations and diagrams explaining operation, applications, and advantages of air conveying. Practical solutions to various types of handling problems, including automated systems, are given. *Dracco Corp.*



231—Materials Handling Equipment

Bulletin 241, "Working for Profit in Every Industry," describes and illustrates the application of Whiting materials handling, foundry, railroad, and chemical processing equipment in metalworking, processing, transportation, and utilities industries. A 32-page pocket size edition includes a reply card. *Whiting Corp.*



232—Storage Tanks

This four-page folder summarizes, through pictures, the many skills and services provided by Graver and its divisions. Storage tanks in many forms and process vessels for a very broad range of industries are shown. The folder includes mention of Graver's fabricating techniques, and specialized products. *Graver Tank & Mfg. Co., Inc.*



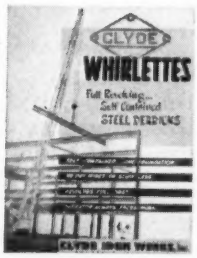
233—Screw Conveyors

Bulletin 957 explains how Flo-tube moves materials mechanically with simplified manual or automatic controls. Flo-tube moves chemicals, coal, gravel, salt, sand, sugar, wood chips, and similar materials from bins and piles to receiving hoppers or processing machines at pre-determined rates, at any angle of incline. *Canton Stoker Corp.*



234—Overhead Handling Systems

Bulletin M-32, "Ideas in Materials Handling," describes how the Whiting Trambeam overhead handling system takes materials from point to point faster and easier, saving time and money with every move. The 12-page booklet includes application drawings for production, shipping, receiving, warehousing, storage. *Whiting Corp.*



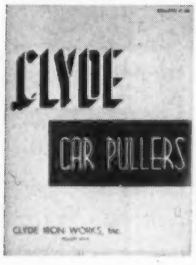
235—Steel Derricks

Advantages gained by using Whirlettes — full revolving, self contained steel derricks — are listed in four-page folder MP-49. The hoist is mounted on the rotating structure and only one foundation is necessary. No guy lines or stiff legs are required. Booklet gives specifications, and illustrates typical uses. *Clyde Iron Works, Inc.*



236—Constant Weight Feeders

Bulletin 253, 16 pages, discusses feeding, proportioning, and batching problems in all types of industries. Various applications of the Model WS Feedoweight and its principle of operation are described. Standard specifications, drawings, and capacities of this automatic continuous gravimetric feeder are given. *Merrick Scale Mfg. Co.*



237—Car Pullers

Ten-page bulletin L-6 shows capstan type car puller for moving cars a short distance using manila rope. Three styles of drum car pullers for heavy duty car moving, shuttle work, or for servicing very large areas are also listed, as well as barge movers for shifting barges back and forth during unloading. *Clyde Iron Works, Inc.*



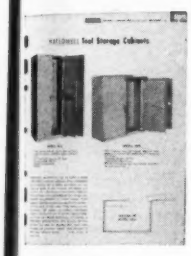
238—Materials Handling Equipment

Bulletin G-3, "Fuller Equipment For The Process Industries," describes Fuller rotary compressors and vacuum pumps; inclined-grate material coolers; Fuller preheater, Humboldt suspension type; Fuller-Kinyon, Airveyor, and F-H Airslide conveying systems for handling dry, pulverized, granular, and crushed materials. *Fuller Co.*



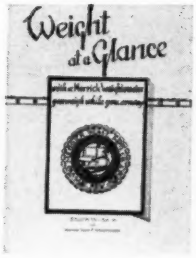
239—Elevated Water Tank

The *ECHO,* quarterly magazine of Graver Tank, features a story on the elevated water tank for the Village of Homewood, Ill. Among other articles — examples of Graver's services as a leading fabricator in steels and alloys — is a story of Graver-designed water treating equipment over the past 50 years. *Graver Tank & Mfg. Co., Inc.*



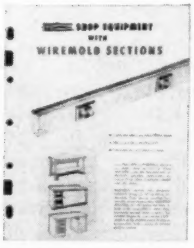
240—Steel Pegboard Cabinets

Catalog sheet gives dimensions and prices of all-metal, tool-storage cabinets lined with removable pegboard panels. Front pegboard panels that swing out with doors are usable on both sides. Available in floor cabinet (75 inches high) and wall cabinet (37 inches high). Panels are available separately. *Standard Pressed Steel Co.*



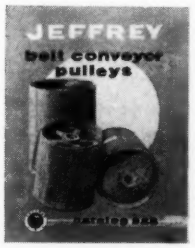
241—Automatic Conveyor Scales

Bulletin 375 describes the Merrick Model E Weightometer and its uses for automatic continuous in-transit weighing of bulk materials over an existing belt conveyor. Specifications and drawings of typical conveyor arrangements shown. Other types of automatic weighing machines also are described in some detail. *Merrick Scale Mfg. Co.*



242—Benchtop Power Outlets

Hallowell Wiremold multi-outlet strips put electric power where needed on benchtops. They have individually grounded, Underwriters-approved, three-prong receptacles spaced every six inches. They can be installed on all Hallowell benches. Catalog sheet gives dimensions, prices, and illustrates types. *Standard Pressed Steel Co.*



243—Belt Conveyor Pulleys

Catalog 928 covers all types of conveyor pulleys; welded steel, cast iron, and welded steel slatted pulleys, all described in detail. Various types of hubs, plain bore or Taper-Lock, are shown along with line drawings and pertinent technical specifications. In-stock status is clearly outlined. *The Jeffrey Mfg. Co.*

MECHANICAL POWER TRANSMISSION



244—Clutches

The Electro Clutch, developed to connect or disconnect a driven shaft or gear from a driving shaft that is either running or standing still, is described in four-page bulletin ECP-656. Photos show the units in typical industrial applications where many output speeds are desired. *I-T-E Circuit Breaker Co., Transformer-Rectifier Div.*



245—Variable Speed Drive

Bulletins on new and complete variable speed drive line contain engineering data, dimensions, specifications, and selection tables: bulletin 1600-B7 on variable speed drive bare unit, 1/3 - 5 hp; bulletin 1610-B1 on motor drives, ½ hp - 25 hp; bulletin 1630-B1 on motor pulleys, ⅛ - ¾ hp; bulletin 1640-B1 on variable speed belts. *Worthington Corp.*



246—Speed Reducers

Catalog SB-57, 40 pages, "Spiral-Bevel Speed Reducers," contains design features, specifying and ordering information, selection tables, service factors and arrangements, dimensions, horsepower ratings, parts lists, overhung load capacities, up and down thrust capacity, photographs of installations. *Philadelphia Gear Works, Inc.*



247—Flexible Gear Couplings

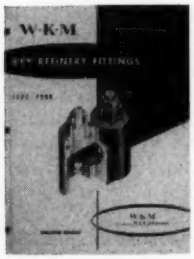
Advantages and typical applications of flexible gear couplings are pictured and described in 16-page catalog C-4, "The Revolutionary New Sier-Bath Flexible Gear Couplings." Couplings are available in standard, vertical, mill-motor, floating shaft and spacer type, and in many special purpose types. *Sier-Bath Gear & Pump Co., Inc.*

PIPING, VALVES, AND PLUMBING



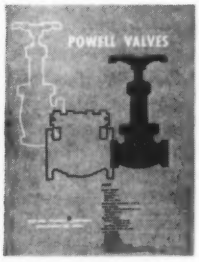
248—Valve Catalog Digest

This new valve catalog digest furnishes the latest coverage of the OIC bronze, iron, cast steel, forged steel, and lubricated plug valve lines in a condensed form. Classified by type and pressure class, and illustrated, this edition also includes face to face dimensions for each size and type of valve listed. *The Ohio Injector Co.*



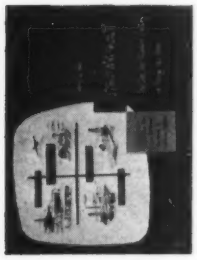
249—Refinery Fittings

Bulletin KR-1157 covers the complete technical specifications of Key Type 7200 refinery fittings, available in standard single-hole tap terminal, standard two-hole return bends, standard corner fittings, standard offset elbows, and special shapes. Pressure — temperature data and available alloys are listed. *W-K-M, a division of ACF Industries, Inc.*



250—Valves

This 24-page catalog describes and illustrates Powell bronze, iron, steel, and corrosion resistant valves, and engineering specialties such as liquid level gages, lubricators, cocks, blow gun and air valves, whistles, and whistle valves. Engineering information included makes this a "must" for your library. *The William Powell Co.*



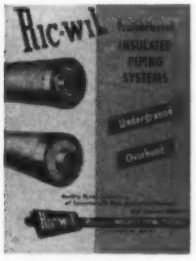
251—Pipe Protection

"Where to Use Tapecoat," eight-page bulletin, presents applications and data on Tapecoat coal tar coating in tape form for double-wrapping on pipe, pipe joints, mechanical couplings, conduit, cable and insulated piping, above and below ground. It includes table of coverage for various sizes and presents case histories. *The Tapecoat Co.*



252—Stainless Steel Fittings

This 22-page catalog explains how Speedline stainless steel fittings reduce piping costs by allowing the designer to take advantage of the new and more economical Schedules 5 and 10 stainless steel pipe. A schematic drawing illustrates use of these fittings for a wide range of industrial applications. *Horace T. Potts Co.*



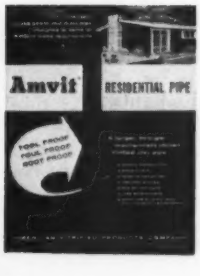
253—Insulated Piping Systems

"Prefabricated Insulated Piping Systems," new 20-page bulletin 57-1, shows typical uses for Hel-cor pipe units for underground or overhead piping systems, and for Utilidor conduits for protection of underground utility services. Sample specifications are given, along with conduit sizing charts and trenching dimensions. *Ric-wiL, Inc.*



254—Lagging Adhesives

Swift's lagging adhesives for heating and process piping, and the 12 important advantages that they offer, are described in four-page folder 9283. They are recommended for bonding shells of molded insulation to themselves or pipes; as binder for loose insulation; and to adhere and size lagging cloth. *Swift & Co., Adhesives Products Dept.*



255—Vitrified Clay Pipe

Mechanically jointed vitrified clay pipe that speeds installation, saves labor, permits deflection, absorbs shocks, permits better flow, requires less maintenance, and is approved by state health and plumbing departments for small capacity jobs is described in six-page folder. Factors affecting pipe are discussed. *American Vitrified Products Co.*



256—Underground Piping

Bulletin SW-1156-55 describes the One-Over-One Cert-A-Bar conduit system—a new development in underground piping layouts for steam and condensate systems and high temperature water systems. Easier installation, smaller and fewer manholes, and elimination of pipe crowding are discussed. *Stillwater Clay Products Co., Conduit Div.*



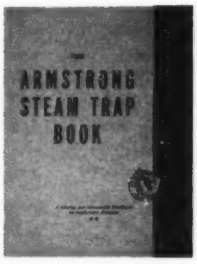
257—Valve Manual

Forty-page catalog B-2 is designed to help engineers select valve types, understand their characteristics, and determine space requirements. It includes such useful data as: pressure drop and flow tables, conversion tables, theory and application, recommended materials, and describes Pratt valves and operators. *The Henry Pratt Co.*



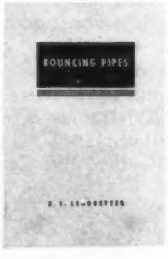
258—Jointed Clay Pipe

Jointed vitrified clay pipe known as Amvit, with a built-in mechanical joint made from polyvinyl chloride is described in four-page folder. Advantages such as infiltration prevention, quick installation, immediate backfilling, better flow, shock absorption, and quick testing in the field are pointed out. *American Vitrified Products Co.*



259—Steam Trap Manual

"The Armstrong Steam Trap Book, 2nd Edition," 46-page catalog J, explains the benefits of good trapping and how you can obtain them. A handbook section provides capacity charts and other data necessary to the correct trapping of all major classes of steam-heated equipment. Manual is completely indexed. *Armstrong Machine Works.*



260—Pipe Vibration

The plague of oscillation set up in pipe lines during pumping of compressible gases is costing industry millions of dollars yearly through inefficiency and pipe systems maintenance, according to booklet, "Bouncing Pipes," which deals in detail with the cause, effect, and remedy of this engineering problem. *Burgess-Manning Co., Snubber Div.*



261—Pressure Regulating Valves

Bulletin 301 provides information on the Clark Type "CRV" pressure regulator. Suitable for steam and non-toxic, non-flammable gas, these pressure regulators are suitable for operation at initial pressures and temperatures up to 250 psi and 450 F. Design features, operation, and proper sizing are shown with specifications. *The Clark Mfg. Co.*



262—Valves

Twenty-page catalog V-55 covers magnetic and motorized valves for air, water, gas, steam, oil, and refrigerants. It includes specifications, sizes, capacities, and suggested applications for each type of valve, flow charts for liquids and compressible fluids, tables of dimensions, and other engineering data. *The Mercoid Corp.*



263—Steam Heating Specialties

Illinois steam heating specialties — packless radiator valves, thermostatic and float traps, vapor systems, and boiler room specialties — are described in eight-page bulletin 201. Cross sections, elevation drawings, specifications, and a description of component parts are included for each item in the line. *Illinois Engineering Co.*



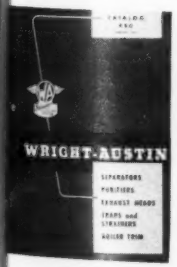
264—Conduit Systems

"Go Underground with Stillwater Conduit Systems," four-page illustrated brochure, describes tunnel and round ceramic conduit systems. It points up advantages of Stillwater Conduit Systems — permanence, protection, adaptability, ease of installation, and efficiency — in service piping. *Stillwater Clay Products Co., Conduit Div.*



265—Wrought Iron Pipe

This 48-page catalog covers the complete line of wrought iron pipe and tubular products. It gives physical properties, specifications, and drawings for each type of product and suggests possible uses. A complete index, installation photos, and conversion tables make this handy reference material for your files. *A. M. Byers Co.*



266—Separators and Purifiers

New 32-page catalog 450 illustrates and describes the most modern equipment used for steam, compressed air, and gas applications. This edition includes typical installations, technical data, selection charts, and general information on the complete line of separators, purifiers, exhaust heads, traps, strainers, and boiler trim. *Wright-Austin Co.*



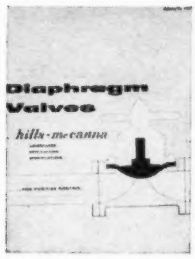
267—Plastic Pipe

These separate application folders in a loose-leaf cover describe use of and specifications for plastic pipe and tubing in: public water works; gas industry and utilities; petroleum industry; and agricultural and turf irrigation. Brochures deal principally with rigid high-impact polyvinyl plastic pipe and fittings. *Kraloy Plastic Pipe Co., Inc.*



268—Welded Stainless Piping

"The Plastic Ductility of Austenitic Piping Containing Welded Joints at 1200 F" is a report of an investigation into the problem of selection of materials for main steam piping. It gives data on the stress rupture characteristics of Types 316 and 347 stainless steel piping adjacent to welded joints. *Pittsburgh Piping and Equipment Co.*



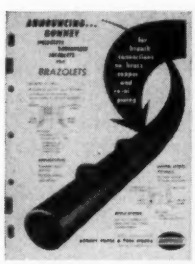
269—Diaphragm Valves

Bulletin 104 describes the exclusive features of Hills-McCanna diaphragm valves for positive closure, and the latest in plastic valves and diaphragms for corrosive services. Charts for diaphragm material selection and dimensional specifications are also given, along with a list of advantages and applications. *Hills-McCanna Co.*



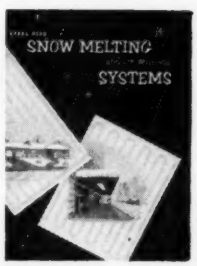
270—Scale-Free Couplings

Bulletin 373 describes Tube-Turn SF welding couplings that eliminate welding scale, icicles, or other protrusions that damage pumps and valves, and cause pressure losses. Specifications are given for sizes ½ thru 12 in. Welding and installation procedures are explained with step-by-step illustrations. *Tube Turns, Inc.*



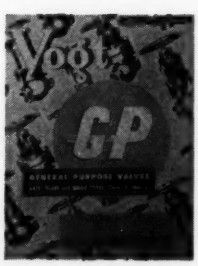
271—Tees

Brazolets used for silver brazing outlets to copper or brass pipe or tubing are described in this bulletin. The outlet portion is brazed or screwed. This construction allows rapid installation of random length mains and subsequent attachment of outlets, plus additional cost savings compared with conventional tees. *Bonney Forge & Tool Works.*



272—Snow Melting Systems

"Steel Pipe Snow Melting and Ice Removal Systems," 32 pages, presents the case for snow melting systems and shows typical installations in commercial and industrial locations. Design data is complete with information on anti-freeze mixtures, sizes, and spacing. *Committee on Steel Pipe Research, American Iron and Steel Institute.*



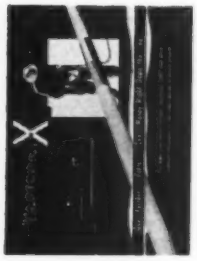
273—General Purpose Valves

New drop forged steel screw and socket weld end valves, in sizes ¼ through 2 in., rated at 800 psi at 850 F and 2000 psi at 100 F, are described in 32-page "General Purpose Valves, Gate, Globe, and Angle Types." Pressure-temperature ratings, specifications, and dimensions are given for each type valve. *Henry Vogt Machine Co.*



274—PVC Pipe and Fittings

Bulletin PF 1200, eight pages, presents a list of applications for PVC pipe and fittings where corrosion resistance, nontoxicity, and noncontamination are required. Mechanical, electrical, thermal, and miscellaneous properties of both normal impact and high impact PVC products are in table form for easy reference. *The Luzerne Rubber Co.*



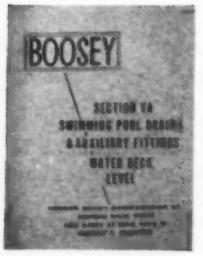
275—Pipe Protection Tape

Tapecoat-X, the coal tar coating in tape form for single-wrap application, is described in this four-page bulletin. Illustrations and data point up economies in time, material, and labor resulting from extra thickness of coal tar available for protecting pipe, pipe joints, fittings, couplings, and tanks. *The Tapecoat Co.*



276—Flow Tubes

The Gentile Flow Tube, now in use for metering water, air, steam, oil, jet fuel, hydrocarbon liquid, clay, slurry, raw sewage, brine, methanol vapors, black liquor, casing head gas, coke oven gas, argon, helium, sludge, white water, and paper stock is described in six-page bulletin FT. Sizes start at ⅜ in. I.P.S. *Foster Engineering Co.*



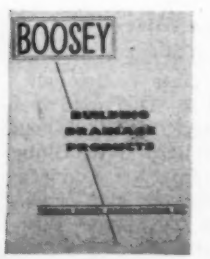
277—Swimming Pool Fittings

New brochure covers water level deck gra. ngs, level control weir, and auxiliary fittings. Gratings and level control weir are available in three types: Deluxe or Boys Club, Standard or medium weight, Economy or light weight narrow type. This type pool eliminates overflow gutters and ladders or steps. *Norman Boosey Mfg. Co.*



278—Piping, Valves, Plumbing

Bulletin PF/4b gives complete dimension tables on Duriron acid resisting pipe and fittings. Also included are physical characteristics of the alloy Duriron, detailed information on acid resisting packing, and installation data. Applications for Duriron include laboratories, plating rooms, and disposal plants. *The Duriron Co., Inc.*



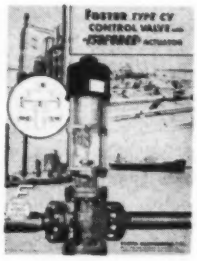
279—Building Drainage Products

A new sectionalized catalog gives the consulting engineer everything at finger tip for any problem in drainage of all surfaces. Sections are: Floor Drains & Auxiliary Fittings; Roof Drains & Auxiliary Fittings; Back Water Valves; Interceptors; Swimming Pool Drains; Drainage Accessories & Specialties. *Norman Boosey Mfg. Co.*



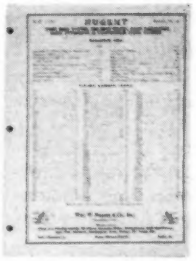
280—Bronze Globe Valves

Circular 602-2 describes the two pressure classes of LQ600 bronze globe valves, with Lunkenheimer Brinalloy seats and discs, for a wide variety of services from normal to very severe. Rated at 140 lbs sp, 300 lbs wog; and 200 lbs sp, 500 F, 400 lbs wog, available in eight different sizes from ¼ to 2 inches. *Lunkenheimer Co.*



281—Control Valves

The Foster Type CV control valve with Isoforce actuator is illustrated and described in this eight-page bulletin. When to use a controller rather than a regulator is pointed out. Elevation drawings, a cutaway, and specifications are given. Included is a two-page sheet explaining the valve's Isoforce utility actuator. *Foster Engineering Co.*



282—Sight Feed Valves

Bulletin 16 deals with needle valve sight feeds for visibly controlling amount of oil to a bearing from a dozen drops per minute to several hundred gallons per hour. Made in pipe sizes ¼ to ¾ in., inclusive. Sight flow indicators are made in pipe sizes ⅜ to 6 in., inclusive. Dimensions and specifications are given. *Wm. W. Nugent & Co., Inc.*



283—Swing Joints

Catalog F-8 gives detailed information on 35 stock styles of OPW swing joints; working pressures and temperature limitations for bronze, steel, monel and alumnium; service instructions; replacement parts; dimensions and specifications; general recommendations for special liquids up to 225 F. *OPW Corp., Jordan Industrial Sales Div.*



284—Safety Cleanout Valves

Bulletin 4004 describes the Petrometer safety cleanout valve for safe removal of water and sludge from storage tanks containing volatile liquids, eliminating danger of fire or explosion. Construction features and operation are discussed fully. The valve can be connected to the tank through liquid level indicator lines. *Petrometer Corp.*



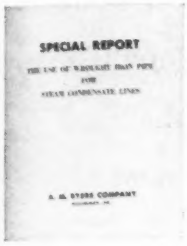
285—Non-Lubricated Ball Valves

Catalog 1000 covers full-bore and reduced port ball valves in steel and semi-steel. Complete specifications cover semi-steel ball valves, from ½ through 6 in., 200 to 400 lbs wog; ASA steel ball valves sizes ½ through 6 in.; ASA series 150; and ½ through 3 in. x 2 in. ASA 300. *W-K-M Division of ACF Industries, Inc.*



286—Stainless Steel Fittings

Complete dimensional data for the full line of Tube-Turn stainless steel welding fittings and flanges are listed in this 56-page catalog. Technical section (14 pages) gives allowable working pressures, corrosion resistance, fitting tolerances, and allowable S values for stainless steel. Welding instructions also included. *Tube Turns, Inc.*



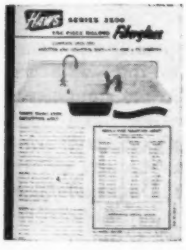
287—Steam Condensate Lines

This technical bulletin, "Use of Wrought Iron Pipe for Steam Condensate Lines," discusses, in detail, corrosion factors and effects common to steam condensate installations. Offers preventive measures for minimizing corrosion and lists maintenance tips on design and installation. Includes reports of wrought iron in this service. *A. M. Byers Co.*



288—Drop Forged Couplings

New drop forged Bonney Flats described in this bulletin are "half couplings" that are beveled for convenience, tapered for strength, flared for flow, and drop forged for strength and ruggedness. In larger sizes the flat Weldolet provides an integrally reinforced nozzle for vessel heads and caps. *Bonney Forge & Tool Works.*



289—One Piece Fountain Unit

New specification sheets cover one-piece glass fiber deck-top, receptor, and fountain unit. Unit has no rim, cracks, or joints, is acid resistant, and comes in five optional colors. Available in 4- and 6-ft lengths. Sheet includes detail drawings, fixture selection chart, installation, and ordering instructions. *Haws Drinking Faucet Co.*



290—Stainless Steel Tubing

Catalog 21 describes small diameter stainless steel tubing produced from 30 different alloys. Complete ordering information is given for Superior's standard size range (from .010- to $\frac{5}{8}$-in. OD in all analyses and thin-wall from $\frac{5}{8}$- to $2\frac{1}{2}$-in. OD in certain analyses). Includes large body of data useful in selection. *Superior Tube Co.*



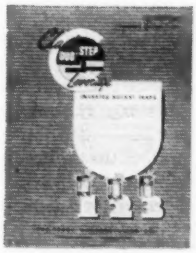
291—Self Cleaning Strainers

New bulletin W-6SC describes the Banks continuous strainer, a self-cleaning strainer with perforations of .023-in. diameter to stop the smallest particles. Description, dimensions, and parts list included. Manual operation or motor driven for pipe sizes ½- to 8-in. for liquid pressure to 125 psi. *Golden-Anderson Valve Specialty Co.*



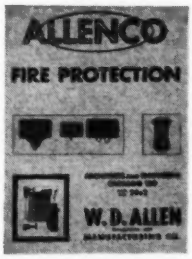
292—Piping Fittings

General catalog 55, 304 pages, presents detailed dimensional data and specifications on a complete line of seamless welding fittings and forged fittings. It includes a 56-page technical data section featuring allowable stress and P/S tables and maximum working pressure charts. Catalog is tab indexed for quick reference. *Ladish Co.*



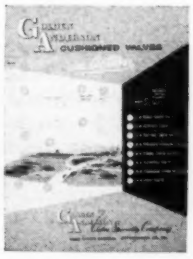
293—Inverted Bucket Traps

Clark Inverted Bucket Traps equipped with Duo-Step leverage are shown in four-page catalog section 230. Full specifications and details are given and cover a range of operating pressures up to 1000 psig and temperatures to 850 F. Proper steam trap can be selected by referring to tables showing continuous flow capacities. *The Clark Mfg. Co.*



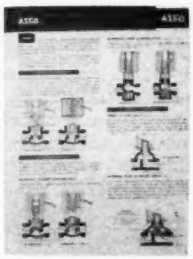
294—Fire Protection

"Allenco Fire Protection," catalog 150, 42 pages, contains specifications and detail drawings for consulting engineers on the complete installation of fire protection units of valves, racks, hose, nozzles, cabinets, either built-in or wall mounted, and standpipe and wall hydrant connections and nozzles. *The W. D. Allen Mfg. Co.*



295—Valves in Action

New descriptive bulletin G-5 graphically shows eight G-A Cushioned valves operating in a municipal water works system. Water level control, emergency fire protection, shock-tamer twins, isolation valves, pressure reducing, and electrical impulse operated valves are described. Figure numbers are given. *Golden-Anderson Valve Specialty Co.*



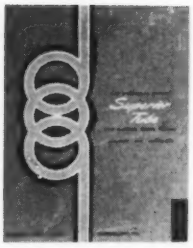
296—Solenoid Valves

New 12-page booklet, "Engineering Information, ASCO Solenoid Valves," provides complete information on valve operation, types of 2,- 3,- and 4-way valves available, and a glossary of terms. Construction drawings simplify selection of the proper valve for a specific application. Flow data includes nomographs. *Automatic Switch Co.*



297—Valve Comparison Chart

"OIC Diamond Anniversary Valve Comparison Chart," bulletin 194-R2, recently completed, covers the latest models of new valve designs manufactured by each company in the valve business. It lists, for the first time, a complete valve trim comparison table. The chart is arranged for easy cross reference. *The Ohio Injector Co.*



298—Hydraulic Tubing

Bulletin 39 describes SAE hydraulic quality low carbon steel tubing. Tables and charts include a comparison of five specifications for hydraulic quality tubing, tube sizes according to velocity versus flow, and recommended maximum working pressures and theoretical bursting pressures for various sizes and wall thicknesses. *Superior Tube Co.*



299—Gate Valve Line

Circular 561 describes and illustrates Lunkenheimer's "King-clip" gate valve line, incorporating 21 patterns in all-iron, and iron body bronze mounted types, for varying service conditions. The simple two bolt collar that eliminates time consuming pipe fitting and provides strength and rigidity is discussed. *Lunkenheimer Co.*



300—Electric Water Coolers

This set of new specification sheets gives complete descriptions, specifications, and capacity characteristics of self-contained electric water coolers. Both air cooled and water cooled types are covered. The bulletin includes data on available accessories, such as extra side-mounted fountains and glass-filler faucets. *Haws Drinking Faucet Co.*

To order personal copies of these bulletins, please fill out the card between pages 4 and 5 or 36 and 37.

PLANT SITE SELECTION



301—Plant Site — Marley Neck

"Where Can You Pick a Plant Site Plum Like This?" is a broadside describing the largest deepwater plant site on the Atlantic seaboard, Marley Neck, Port of Baltimore. The booklet includes colored maps and a comprehensive air view of some 4200 acres on Chesapeake Bay near the heart of the city. *Baltimore and Ohio Railroad.*



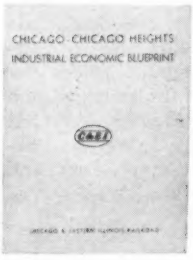
302—Bedford, Ohio

"Industrial Park in Metropolitan Cleveland" outlines the advantages of Bedford, Ohio, 1½ miles from Cleveland city limits, where a 200-acre area is available for medium-sized industries and distribution facilities. Labor force, taxes, transportation, raw materials, utilities, and community are described. *Erie Railroad.*



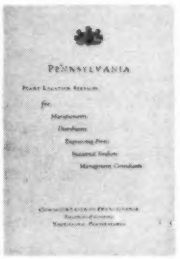
303—100 Percent Financing

"100% Financing for Your New Plant," a booklet describing the special Pennsylvania plan for 100 percent financing of new industrial plants in the state, tells how total financing can be achieved without cash investment by the manufacturer and gives other advantages of locating in the state. *Commonwealth of Pennsylvania, Dept. of Commerce.*



304—Chicago Area

"Chicago & Chicago Heights Industrial Economic Blueprint" tells what industrial plant sites are available in these areas; where they are in relation to transportation, shipping, and other facilities; what materials are plentiful; what the labor situation is; kinds of housing and schools available. *Chicago & Eastern Illinois Railroad.*



305—Plant Location Services

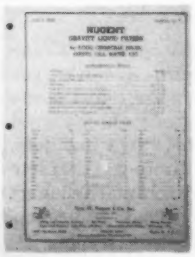
"Plant Location Services," an eight-page booklet for consulting engineers, manufacturers, distributors, engineering firms, industrial realtors, and management consultants, describes the industrial plant location services offered by the Pennsylvania Department of Commerce. *Commonwealth of Pennsylvania, Dept. of Commerce.*



306—Plant Sites

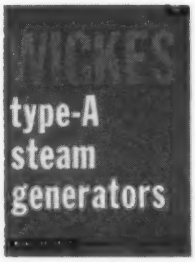
"Look Where a Site is Production-Right," 24-page brochure, presents data useful to consultants and executives responsible for new plant location. Illustrated with colored maps, it describes power, fuel, labor, water, weather, key materials, transportation, and plant sites that offer best plant site possibilities. *Baltimore and Ohio Railroad.*

POWER EQUIPMENT AND FUELS



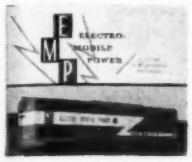
307—Gravity Oil Filters

Bulletin 7 deals with gravity fuel and lubricating oil filters with or without automatic water separating compartments. Capacities range from 6 to 2000 gph inclusive, in single units with ample storage capacity for clean filtered oil. Complete specifications and dimensions are given along with drawings. *Wm. W. Nugent & Co., Inc.*



308—Water Tube Boilers

Wickes Type A steam generators, compact, efficient, shop assembled water tube boilers, are illustrated and described in catalog 56-1. It gives typical superheater arrangements for the boilers with section, plan, and side views of drainable "S," pendant, and drainable superheaters. Specifications are given. *The Wickes Boiler Co.*



309—Mobile Power

Eight-page bulletin 26M57SS covers Electro Mobile Power, a new tool in a-c generation for utilities. It explains how best to provide for the short time peak, gives operating costs, and lists features of the EMP source. Specifications and an elevation drawing are given. *Electro-Motive Div., General Motors Corp.*



310—Hydraulic Turbines

Details on the Leffel turbines that drive both power generation and pumping units at the United States Bureau of Reclamation Chandler Power and Pumping Plant in the state of Washington are given in 12-page bulletin 1098-E. Descriptive literature on other recent Leffel turbine installations will be enclosed. *The James Leffel & Co.*



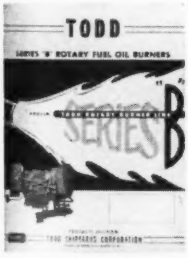
311—Electric Plants

Catalog KEP56-1, 24 pages, shows the line of Kohler electric plants used as an independent source of electricity for sole supply and for automatic standby when central station power fails. Sizes range from 500 w to 50 kw, gasoline and diesel. Battery charging units in 6, 12, 36, and 140 v capacity are described. *Kohler Co.*



312—Packaged Boilers

Bulletin BA-256, four pages, presents in table form complete design specifications for Continental automatic boilers with 100 to 500 hp ratings with modulating control. The bulletin illustrates and describes advantages and features of the design. Boilers fire No. 2, 5, and 6 oil or gas. Specifications are given. *Boiler Engineering & Supply Co., Inc.*



313—Rotary Burners

The new Todd Series B rotary fuel oil burners are summarized in four-page bulletin TD56-82X. It includes a burner size selector chart and lists 11 advanced design features of seven basic sizes rated from 400,000 to 22,500,000 Btu per hr, with oil capacity from 3 to 150 gal per hr. *Products Div., Todd Shipyards Corp.*



314—Packaged Boilers

These two bulletins cover Series E and F Continental automatic boilers with ratings of 20 to 80 hp, with on-off control and modulating control. Units use No. 2, 5, and 6 oil or gas or can be furnished to burn either. Bulletins give specifications, dimensions, capacities, types, and illustrations of various sizes. *Boiler Engineering & Supply Co., Inc.*



315—Condensate Control

Condensate drainage control with the Cochrane C-B System is fully discussed in publication 6025. It presents a theory of heat transfer losses due to the build-up of a layer of condensate on the inner surface of the transfer wall. How the C-B System eliminates this condensate is shown by various case histories. *Cochrane Corp.*



316—Atomizing Burners

The Todd Vee-Cee type variable capacity mechanical atomizing fuel oil burner for installations with widely fluctuating loads is fully described in four-page bulletin TD56-16X. Bulletin shows special construction that gives uniform, easily oxidized spray, constant pressure, and quick cold starting. *Products Div., Todd Shipyards Corp.*



317—Forced Draft Package Burners

If your client needs a factory assembled burner that can be installed with minimum cost and time, send for four-page bulletin 10M-2-15-57 on the Johnson forced draft package burner. Units that burn oil, gas, or either are pictured with a description of operation and special construction features. *S. T. Johnson Co.*



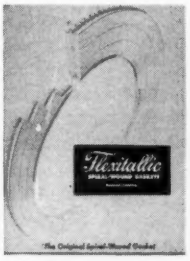
318—Water Tube Steam Generators

Water tube Type D Superior steam generators with capacities up to 50,000 lb steam per hour are described in eight-page bulletin. With the literature comes a 12-page folder of specifications prepared to aid consulting engineers in selection, evaluation, and specification of water tube packaged units. *Superior Combustion Industries, Inc.*



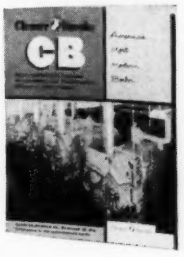
319—Mobile Generating Stations

Eight-page bulletin 23M57RL describes a 500-kw mobile highway generating station for utilities, providing for disaster protection, planned outage, standby power, service to new demands, local seasonal peaks, and line relocation. Each component of the trailer is described and dimensions are given. *Electro-Motive Div., General Motors Corp*



320—Spiral-Wound Gaskets

General catalog, 28 pages, tells about the development of the original spiral-wound gasket and its present applications in aviation, atomic research, process industries, power plants, and ships of the Navy and Merchant Marine. It also lists various metals and fillers used in the manufacture of these gaskets. *Flexitallic Gasket Co.*



321—Self-Contained Boilers

Bulletin AD 162 describes basic design features of Cleaver-Brooks model CB self-contained boilers: four pass, forced draft design with 5-sq-ft heating surface per boiler horsepower. Rated 15-200 hp: oil, gas, or combination fired with quick fuel interchange. For heating or processing, steam or hot water. *Cleaver-Brooks Co.*



322—Condensate Return Systems

Schaub condensate return units, which consist essentially of a motor driven pump and a receiver, and which are used to recover condensate from low pressure heating returns and boost it back to a centralized receiver, are described in four-page bulletin 655-C. Tables help you to select the right model. *Fred H. Schaub Engineering Co.*



323—Boilers and Stokers

Complete descriptive and specification information on rugged Scotch boilers for gas, oil, and coal firing, and automatic underfeed stokers for Scotch type boilers, is given in 28-page bulletin 236. This well illustrated brochure includes test results, performance data, and complete details of design and construction. *The James Leffel & Co.*



324—Condenser Expansion Joints

Discussion of expansion problems of turbine exhausts with special reference to modern, large or twin condensers is presented in this four-page bulletin. It shows construction of the Henry Pratt Rubber Belt Expansion Joint, and details advantages, such as simplified engineering of piping and temperature tolerance. *The Henry Pratt Co.*



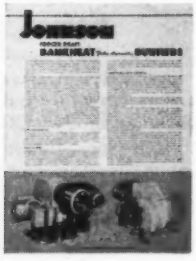
325—Packaged Boilers

How Superior's four-pass boiler design lowers steam costs is explained in 20-page booklet. Rotary burner, gas burner, controls, and built-in induced draft feature are each described. Cutaway drawing shows path of combustion gases through the four passes. Data and dimensions are presented in table form. *Superior Combustion Industries, Inc.*



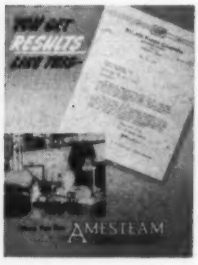
326—VP Packaged Boilers

Catalog P391, 16 pages, describes the new Type VP package boiler. Following a section of background information is an outline of principal design features. These boilers are shop assembled and provide steam capacities from 4000 to 42,000 lb per hr. Space requirements and specifications are in table form. *Combustion Engineering, Inc.*



327—Forced Draft Burner

Fundamental difference between an ordinary gun type burner and the Johnson Bankheat forced draft burner is explained in bulletin 10M-2-57. Installation drawings show the burners in operation in warm air, hot water, and steam systems. Sizes and capacities are listed for units burning oil, gas, or a choice of either. *S. T. Johnson Co.*



328—Packaged Boilers

Bulletin GB-1 shows installations of automatic packaged boilers, plus actual testimonial letters. All stress these units' compactness, efficiency, long life, low installation and maintenance costs. Units are available in standard sizes 15 through 200 psi for oil, gas, or combination of oil or gas firing equipment. *Ames Iron Works, Inc.*



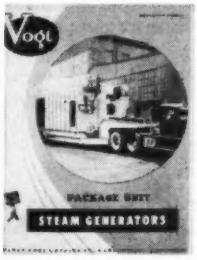
329—Diesel Engines

Complete 80-page catalog includes power curves, sectional drawings, and sub-assembly photographs of six basic engines in 19 models, a power range of 100 to 2150 bhp. Diesel, gas, and dual fuel engines and generator sets are available as a custom installation. Use of low cost fuels is discussed. *White Diesel Engine Div., White Motor Co.*



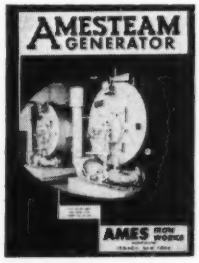
330—Convertible Package Boilers

Water tube package units that can be converted to coal firing during periods of oil or gas fuel shortages are described and illustrated in eight-page bulletin 600. Design and construction features, burner equipment for various fuels, standard and optional panel board equipment, and tests are discussed. *International Boiler Works Co.*



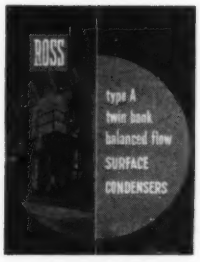
331—Packaged Steam Generators

Bulletin PSG-2, 10 pages, presents design and construction details, tables of capacities, dimensions, and weights of package unit type steam generators. Available in three standard pressures of 175, 250, and 375 psig, the boilers are designed to be used with many different types of firing and control equipment. *Henry Vogt Machine Co.*



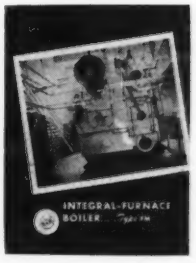
332—Automatic Boilers

Bulletin AXY-1 gives detailed specifications for steam generating and hot water units. Available in standard sizes 15 through 200 psi for oil, gas, or combination oil or gas fired equipment, these automatic boilers are completely factory assembled and tested, ready to operate packaged generator units. *Ames Iron Works, Inc.*



333—Surface Condensers

Twin Bank Balanced Flow design surface condensers — complete description, design details, exclusive features, and numerous photos of public utility and industrial power plant installations — are presented in 32-page bulletin 8.2K1. Details of Single Bank Balanced Flow design are in bulletin 8.1K1. *Ross Heat Exchanger Div. of American-Standard.*



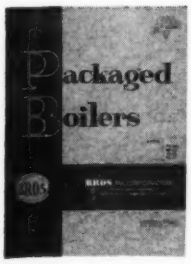
334—Boilers

Bulletin G-76D describes the B&W Integral-Furnace boiler—Type FM. Complete size, dimension, and weight specifications along with interesting operational data are included. This completely shop-assembled, compact, reliable unit has a capacity range to 50,000 lbs steam per hr, pressures to 250 psi. *The Babcock & Wilcox Co.*



335—Retracting Soot Blower

Bulletin 1079A describes improved Model IR short retracting soot blower for cleaning water cooled boiler furnace walls, hopper slopes, or narrow portions of tube banks adjacent to walls. Removes all dust and most slag deposits. Air motor, electric motor, or manual operation. Operates in very hot zones. *Diamond Power Specialty Corp.*



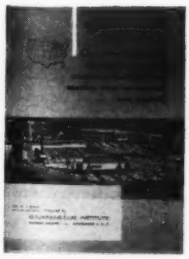
336—Packaged Boilers

Bulletin WT-10 describes and illustrates packaged boilers, with capacities from 8500 to 50,000 lbs per hour at standard design pressures up to 250 psi. Drawings and specifications, design and construction features are given in detail. Bulletin also shows how these boilers fit into your clients' planning for future needs. *Bros. Inc.*



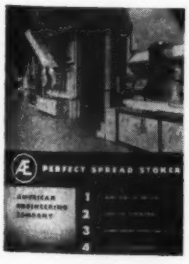
337—Packaged Generators

The Pantex Speedylectric packaged steam generators are described and illustrated in six-page bulletin SG-100. Basic principle of Speedylectric electrode steam generator operation and construction is discussed. Units have built-in balanced control with ratings 2 to 60 bhp, 15 to 475 psig. Specifications are given. *Pantex Mfg. Corp.*



338—Coal for Heating and Cooling

This 16-page brochure describes fully the boiler plant for heating and cooling the recently completed Hillside Shopping Center, Hillside, Illinois. This is another example in a series of well-engineered coal-fired plants. Drawings are included showing the boilers and coal and ash-handling equipment. *Bituminous Coal Institute.*



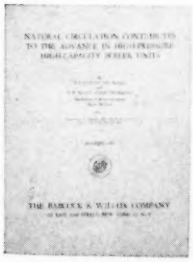
339—Spread Stokers

This automatic coal firing unit for installations of 175 hp to 500,000 lbs steam per hr and upward is engineered for top efficiency with both low and high ash coals. Conveyor feeder won't clog and provides even distribution and continuous feeding through entire range of 50 to 7500 lbs of coal per hr. *American Engineering Co.*



340—Stationary Gas Engines

Bulletin SA-609 gives specifications and performance data on R-110, 4-cylinder and R-165, 6-cylinder stationary gas engines, with maximum horsepower ratings of 130 and 190, respectively. Units are for standby or continuous duty power for sewage treatment plants, municipal water works, and industrial applications. *Climax Engine Mfg. Co.*



341—Natural Circulation Boilers

"Natural Circulation Contributes to the Advance in High-Pressure, High-Capacity Boiler Units," 12-page bulletin 3-544, by S. T. Mackenzie and G. W. Kessler of B&W, gives the history of development of these more economical boilers. Figures, graphs, and charts are based on the B&W Cyclone furnace. *The Babcock & Wilcox Co.*



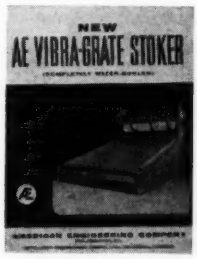
342—Boiler Company Background

This 16-page booklet was designed to acquaint you with the Posey Iron Works Co. — its six divisions, Steel Plate, Brick Machinery, Iroquois, Foundry, Industrial Heating, and Steel Form — and the manufacturing advantages provided by their extensive facilities. Typical products of each are pictured. *Posey Iron Works, Inc.*



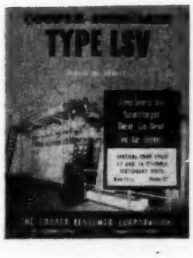
343—Guide Specifications

This 64-page brochure, including 5 drawings, is a comprehensive guide for preparing specifications on coal-fired low-pressure heating plants in the size range of 750,000 to 5,500,000 Btu per hr. All aspects affected by the choice of fuels from storage bin to stack design are covered fully in the bulletin. *Bituminous Coal Institute.*



344—Vibrating Grate Stoker

A water cooled vibrating grate stoker (sizes from 25,000 to 150,000 lbs steam per hr) that does not require a dust collector even at low ratings is described in this bulletin. Burns low grade coals and is easily adapted for burning gas or oil in combination with coal, or for the burning of coal alone. *American Engineering Co.*



345—Engines

Bulletin LSV-77 gives description and engineering specifications on diesel, gas, and gas-diesel engines for stationary power applications. Complete information is given on vertical in-line and V-angle 4-cycle engines, available as atmospheric and supercharged for power capacities up to 5000 hp. *The Cooper-Bessemer Corp.*



346—Mobile Generating Stations

Trailer mounted mobile generating plants, complete rolling power stations, are described in this plastic-bound handbook. For temporary tie-in, or semi-permanent installation diesel or dual fuel operation may be practical in four sizes 350-, 500-, 1000-, and 1250-kw. *White Diesel Engine Div., White Motor Co.*



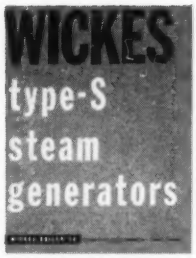
347—Stationary Gas Engines

Bulletin SA-584-B gives specifications and performance data on V-80 and V-85, 8-cylinder stationary gas engines with maximum horsepower ratings of 340 and 390, respectively. Units are for standby or continuous duty power for sewage treatment plants, municipal water works, and other industrial applications. *Climax Engine Mfg. Co.*



348—Modern Power Plants

To clarify the many questions that arise during the planning stage of a modern power plant, Cyclotherm has published this 56-page catalog covering a complete line of steam and hot water generators. Included are specifications, dimensions, and ratings for units for oil, gas, or oil or gas firing. *Cyclotherm Div., National-U. S. Radiator Corp.*



349—Two-Drum Boilers

Wickes Type S steam generators, two-drum, water tube boilers built to a design pressure of 725 psi, are described in catalog 55-2. These units combine the water cooled furnace as an integral part of the boiler, adapting the high and low type furnace to the desired type of firing — coal, oil, or gas. Specifications are given. *Wickes Boiler Co.*



350—Cooling Tower Fans

Bulletin F-57 describes the complete line of Marley multi-blade cast aluminum fans for cooling tower application. Performance and operating characteristics are outlined along with details on assembly, adjustability, and other information essential to selection of Marley fans for either original or replacement equipment. *The Marley Co.*

PROCESS EQUIPMENT



351—Mixers

"Simpson Mix-Mullers for the Ceramic Industry," four-page bulletin, outlines how this unit is used in the preparation of electronic porcelain, tile, structural clay and brick, refractories, whiteware, artware, dinnerware, and other ceramic bodies. Capacities, dimensions, and specifications on various models are listed. *National Engineering Co.*



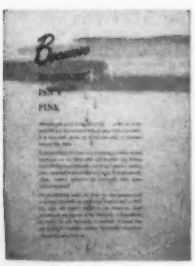
352—Tanks and Chests

Kalamazoo vitrified glazed tile tanks and chests are described in four-page bulletin 1 55-T. Drawings and photos show how the two types of tile blocks available provide flexibility of wall design. Types, sizes, design, erection, and cost are discussed, and typical installations in industry are pictured also. *Kalamazoo Tank and Silo Co.*



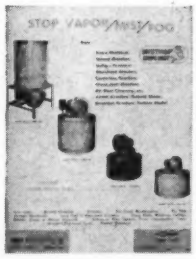
353—Silencers

Series ADS acoustic discharge silencers, designed to eliminate both high and low frequency noises caused by high velocity steam and air discharged to the atmosphere, are described in four-page bulletin 265. Specifications are given for optimum silencing, standard silencing, and for heavy industrial areas. *Burgess-Manning Co.*



354—Humidity Control

Bulletin 222 is a 32-page manual covering many examples of increased operating efficiency due to humidity control. Equipment illustrated includes air conditioning type Lectrodryers for maintaining lower humidities in rooms, high and low pressure air and gas dryers, breathers for storage tanks, and filters. *Pittsburgh Lectrodryer Corp.*



355—Vapor Collectors

Vapor, mist, and fog control bulletin 622-3 illustrates the complete line of Aget Miskop vapor collectors and gives specifications on each model. Applications throughout industry are described in detail and illustrated. Ways in which Miskops can improve production and cut down product rejects are shown. *Aget Mfg. Co.*



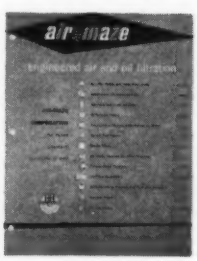
356—Compressed Air Drying

Four-page bulletin 223B covers the Lectrodryer equipment designed especially for handling compressed air, with particular reference to instrument air applications. It provides data on need for instrument air drying, moisture content of compressed air, and proper dewpoint and relative humidity. *Pittsburgh Lectrodryer Corp.*



357—Wood Tanks

Wendnagel Tite wood tanks, tubs, and sinks for all types of industries are described in four-page bulletin 23. Suggested uses will give you an idea of how these products fit in with your clients' needs. Examples shown include tanks for sprinkler systems, processing, general water supply, and metal pickling. *Wendnagel & Co., Inc.*



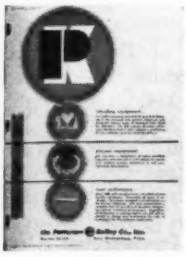
358—Air and Oil Filters

Bulletin ACL 157 gives design and performance data on the complete line of air and oil filters. Panel, oil-bath, oil-wetted, and dry type filters; low and high pressure oil and fuel filters; air intake silencers, spark and flame arresters; breather and air line filters are included with cutaway illustrations. *Air-Maze Corp.*



359—Proportioning Equipment

This twelve-page bulletin includes typical installation diagrams and complete details of multi-liquid proportioning and blending systems for liquid production processing. Simplicity and compactness of the Xacto blending system is explained and illustrated with flow diagrams. Typical wiring diagrams also are given. *Bowser, Inc.*



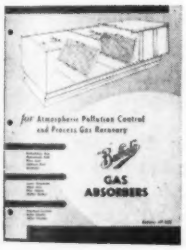
360—Mixing Equipment

Catalog 15 discusses types of blending equipment for chemical and process industries. Tables of dimensions and capacities are given for Twin-Shell production and "Liquid-Solids" blenders. Operating principles are outlined. Ribbon and double cone blenders are covered as are special heat exchangers. *The Patterson-Kelley Co., Inc.*



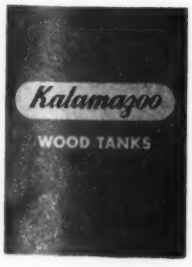
361—Process Equipment

General catalog 58 provides information on the complete line of corrosion resistant products manufactured by Duriron. The equipment includes pumps, valves, filters, pipe and fittings, anodes, pans, heat exchangers, steam jets, tower sections, ejectors, tank outlets, and mixing nozzles. Includes Durco alloy data. *The Duriron Co., Inc.*



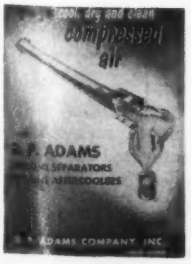
362—Gas Absorbers

Buffalo bulletin AP-225 gives complete data on gas absorbers designed to remove soluble gases, vapors, and mists from exhaust streams before discharge. Suitable for pollution control and process gas recovery, the units are available in any capacity without adverse effect on efficiency or change in operating characteristics. *Buffalo Forge Co.*



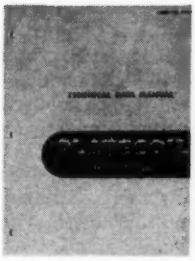
363—Wood Tanks

Eight-page bulletin 655-W explains why wood tanks can meet conditions other types of tanks cannot. It describes round, rectangular, and special tanks, vats, boxes, sinks, and flumes and lists possible uses for each along with the type of hardware and lining available, and gives installation photos. *Kalamazoo Tank and Silo Co.*



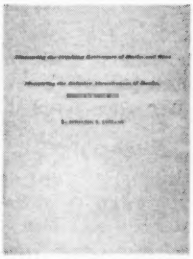
364—Aftercoolers-Separators

Bulletin 711 is a 12-page guide to limiting hidden costs of compressed air systems. It highlights the benefits of dry compressed air; provides a check list to determine amount of removable moisture entering distribution line; and includes selection charts and cutaways of aftercoolers and cyclone separators. *R. P. Adams Co., Inc.*



365—Heat Transfer Manual

Technical Data Manual 514-C contains technical and engineering information concerning Tranter Platecoil heat transfer capacities and characteristics. Informative charts and tables based on research, experimentation, and field experience provide valuable short cuts in selection of heating and cooling systems. *Platecoil Div., Tranter Mfg., Inc.*



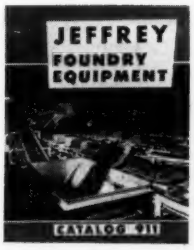
366—Crushing Resistance

"Measuring the Crushing Resistance of Rocks and Ores," 12-page booklet written by Benjamin B. Burbank, noted metallurgist, presents methods and equipment for measuring crushing resistance and abrasiveness of rocks, minerals, and ores. Detail sketches of testers are included. *Pennsylvania Crusher Div. of Bath Iron Works Corp.*



367—Refrigeration Equipment

Detailed 16-page manual TV-320 covers operation, application, and specifications of Kramer "L" Thermobank, fastest completely automatic re-evaporative hot gas defrost system for low temperature refrigeration installations. Included are engineering data with applications from 32 to 75 F, ratings at various levels. *Kramer Trenton Co.*



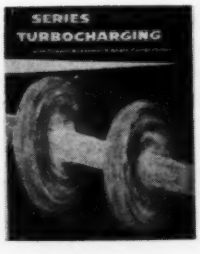
368—Foundry Equipment

Catalog 911 covers the entire line of Jeffrey foundry equipment. Subdivided into four separate sections, this 76-page catalog combines descriptions with drawings and installation photographs to develop comprehensive picture of products, including the new "package" sand handling system for smaller foundries. *The Jeffrey Mfg. Co.*



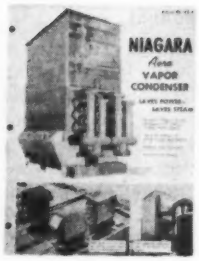
369—Refrigeration Components

Catalog form G-124R describes semi-hermetic refrigeration condensing units and motor compressors, ¼ through 3 hp. Included are air-cooled, water-cooled, combination air-and-water-cooled, and truck units. Illustrations and specifications of seven models are given. *The Brunner Co., subsidiary of Dunham-Bush, Inc.*



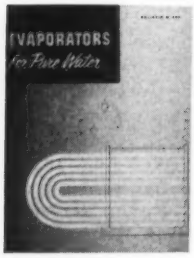
370—Series Turbocharging

Engineering bulletin ST-82 describes new power generating development through series turbocharging of 2-cycle gas engines. Applications are for gas transmission and petroleum and chemical processing. Principle can be applied to new and existing Cooper-Bessemer V-angle compressors to develop up to 3500 hp. *The Cooper-Bessemer Corp.*



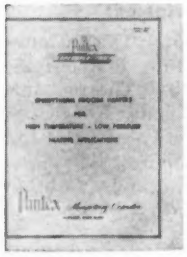
371—Vapor Condensers

Two-page bulletin 129R describes and diagrams functions and operation of Aero vapor condensers, new equipment to replace barometric type condensers that require large supplies of water and can not attain as high a vacuum. Uses illustrated include condensing steam, vapors, chemicals and intermediates, and reflux cooling. *Niagara Blower Co.*



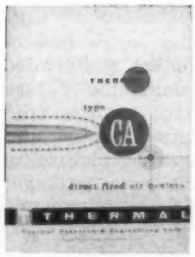
372—Evaporators

"Evaporators for Pure Water," bulletin M-305, presents advantages of Yuba evaporators, bubble tray, mechanical, multiple effect, and marine type. It shows how the units are made and pictures typical applications in various types of industries. Operation is illustrated by means of cutaway line drawings. *Yuba Consolidated Industries, Inc.*



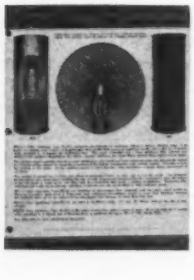
373—Process Heaters

Bulletin 38-D covers equipment for electrically generating and transferring heat to process units by circulating high temperature vapor or liquid at low pressure. It describes how the electrode principle is utilized to heat liquid without subjecting it to excessive temperatures that cause chemical breakdown. *Pantex Mfg. Corp.*



374—Direct Fired Heaters

Thermal Type CA direct fired air heaters, for applications where products of combustion can be mixed with the air being heated, are illustrated and described in bulletin 112. Operation, construction, and specific and suggested applications are included. Typical sizes for various air flows are given. *Thermal Research & Engineering Corp.*



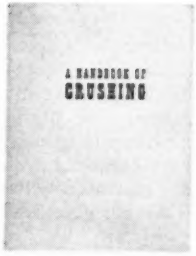
375—Filter Cartridges

Bulletin F-152-3 describes the new Hilco oil filter cartridges with specially treated, fine quality filter paper consisting of 50 square feet of filtering area. Featuring high flow rate and low pressure drop, the cartridge can filter particles down to 55 microns. Flow rate charts are given for various sizes. *The Hilliard Corp.*



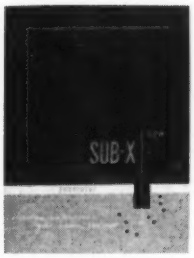
376—Heat Transfer Costs

"How to Cut Heat Transfer Costs," bulletin IP-356, features a detailed description of Tranter Platecoil construction, including specifications and dimensions. It lists and illustrates ten major advantages claimed for Platecoil and detailed sketches show how it has solved industrial heating problems. *Platecoil Div., Tranter Mfg. Co., Inc.*



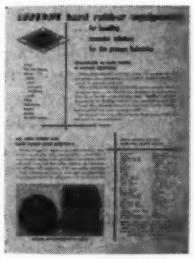
377—Handbook of Crushing

"Handbook of Crushing," 40-page booklet, presents a wealth of data for any engineer faced with the problem of selecting the proper crusher for a certain job, or with analysis of a present installation. It gives details of selection, capacities, arrangements, types, and sizes. *Pennsylvania Crusher Div. of Bath Iron Works Corp.*



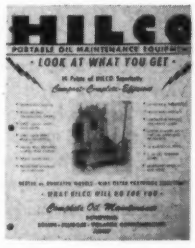
378—Inert Gas Generators

Operating principles of the Thermal Sub-X inert gas generator are detailed in four-page bulletin 114. A schematic piping diagram is given for both gas and oil operation, along with sizes for typical capacities, suggested application for special installations, a list of typical uses, dimensions, and specifications. *Thermal Research & Engineering Corp.*



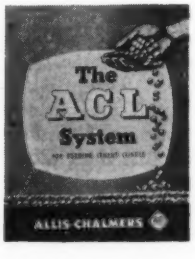
379—Hard Rubber Equipment

This four-page folder gives a general outline of hard rubber pipe and fittings, pumps, valves and containers. It contains dimensions of pipe fittings and valves, also diagrams and performance curves of hard rubber pumps. It lists the types of corrosive solutions that this equipment will handle safely. *Luzerne Rubber Co.*



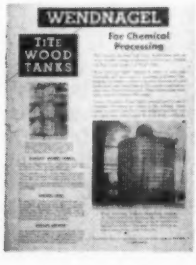
380—Oil Maintenance Equipment

Bulletin 316 describes the advantages of 14 features of Hilco's portable oil maintenance equipment, especially designed for removing solids, sludges, volatile contaminants, and acids. Depicts the available heated and unheated models and shows some major applications. Lists complete details of uses, sizes, etc. *The Hilliard Corp.*



381—Cement Kiln

The ACL system for burning cement clinker is discussed in eight-page bulletin 07B8431. Principle advantages including lower duct loss, lower fuel consumption, lower power consumption, and less space are listed. Flow diagrams show how the system works and a graph relates cost of fuel to clinker produced. *Allis-Chalmers Mfg. Co.*



382—Chemical Processing Tanks

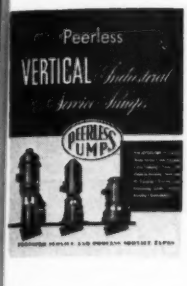
Typical Wendnagel wood tanks manufactured for use in chemical processing are shown in this two-page bulletin. Resistance to decay, acids, and chemicals, and superior insulating properties are pointed out. Types for fire protection, water storage, wine storage, and scrubbing towers are illustrated. *Wendnagel & Co., Inc.*

PUMPS AND COMPRESSORS



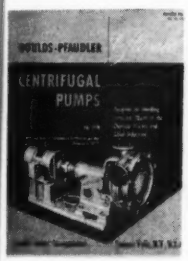
383—Submersible Booster Pumps

Verti-Line submersible booster pumps and motors (designed by Layne & Bowler and General Electric) are described in four-page folder 400. It gives specifications, selection tables, and application data. Sketches show pumps in typical installations for cooling tower service, sump operation, and fire protection. *Layne & Bowler Pump Co.*



384—Vertical Industrial Pumps

Bulletin B-505 illustrates and describes diverse applications for vertical turbine type pumps in industrial service such as for cooling towers and booster service. Flexibility in operation is featured. Hollow shaft or solid shaft motors may be used as well as steam turbine or right angle gear drives with engines. *Peerless Pump Division, F.M.C.*



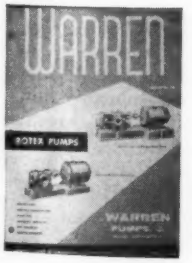
385—Glassed Centrifugal Pumps

Bulletin 725.2 describes the Goulds-Pfaudler glassed centrifugal pump, designed for handling corrosive liquids in the chemical, process, and other industries. Built in four sizes for capacities up to 700 gpm and heads up to 140 feet. Specifications, performance curves, resistivity data, and materials of construction given. *Goulds Pumps, Inc.*



386—Industrial Pumps

Easy to use table for determining horsepower, capacity, and head for close-coupled vertical pumps makes bulletin 1100 worth keeping. It also contains sectional views, material specifications, schematic application drawings, and photos of installations. Verti-Line pump features are clearly illustrated and described. *Layne & Bowler Pump Co.*



387—Positive Displacement Pumps

Warren Rotex pumps, rotary type positive displacement pumps for moderate viscosity, low viscosity, and medium pressure are featured in eight-page bulletin 50. Two general types are described: geared-in-head and external gear and bearing. Cutaways, dimensional drawings, and selection charts are included. *Warren Pumps, Inc.*



388—Double Suction Pumps

Performance data, dimensions, and specifications on the De Laval single-stage double-suction Types L, M, and P centrifugal pumps, with capacities of 1000 to 20,000 gpm and heads to 350 ft, are presented in six-page bulletin 1004. Features, construction, dimensions, and advantages are described. *De Laval Steam Turbine Co.*



389—Submersible Pumps

Sumo deep well submersible pumps, that operate inside the well completely submerged in water, need no pump house, are unaffected by freezing weather and floods, and are safe from tampering, are described in bulletin B-254A. It details construction features and gives selection data on 4- and 6-in. pumps. *Sumo Pumps, Inc.*



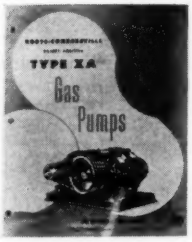
390—Heavy Duty Screw Pumps

Bulletins S4 and SE5 describe line of screw pumps for heavy duty pumping of lubricating and non-lubricating fluids and semi-fluids, from 32 to 1,000,000 ssu; capacities 1 to 1000 gpm; discharge 1000 psi for viscous liquids, 500 psi for water. Internal or external bearing types, vertical or horizontal available. *Sier-Bath Gear & Pump Co., Inc.*



391—Compressors & Vacuum Pumps

Bulletin C-6 describes Fuller rotary compressors and vacuum pumps, gives cutaway drawings, and illustrates uses by pictures of typical in-plant installations. For compressing air and gases, units have capacities to 3300 cfm, pressures to 125 psig; vacuums to 22.95 in. (with reference to 30 in. barometer). *Fuller Co.*



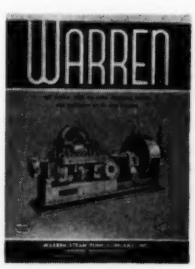
392—Rotary Positive Gas Pumps

Bulletin 31-B-17 deals with rotary positive displacement gas pumps, 7-in. gear diameter and smaller, and accessory equipment. Selection tables, dimensions, performance data, and illustrations for 18 standard sizes are given for 0.5 sp gr gas, capacities 5 to 670 cfm at pressures 1 to 6 psig. *Roots-Connersville Blower.*



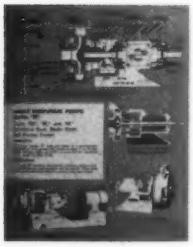
393—Double Suction Pumps

De Laval single stage double suction Types T, U, and W centrifugal pumps for handling large volumes of water are described in six-page folder 1005. Advantages of each construction feature are detailed and a cutaway drawing given. Double volute pumps for heads of 250 feet and higher are described briefly. *De Laval Steam Turbine Co.*



394—High Pressure Pumps

Six stage, high pressure pumps of the centrifugal type are described in six-page bulletin 244. Illustrations show construction, parts, specifications, and special features for pumps with pressure range up to 1200 psi. Bulletin recommends use of these pumps for boiler feedwater, in pipelines, and for mine drainage. *Warren Pumps, Inc.*



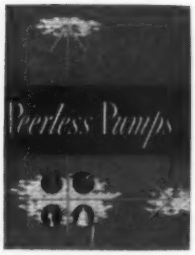
395—Corrosion Resistant Pumps

Bulletin "H" describes the new line of "H" Series pumps for abrasive and corrosive liquids and hot liquids. Shows various types of water-ends and other modifications to meet particular conditions in various applications. Gives dimensions of 35 of the 60 possible size combinations that are available from stock. *Nagle Pumps, Inc.*



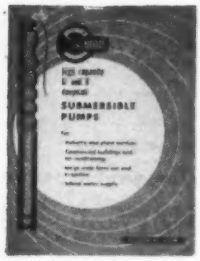
396—Centrifugal Pumps

Bulletin 500, six pages, describes single stage end suction Type G, K, and KH base mounted pumps. Sectional view of impeller, available closed or open, is given along with giant selection table for pumps with heads to 260 feet and capacities to 1700 gpm with alternate choice of 3500 and 1750 rpm. *Weinman Pump Mfg. Co.*



397—Centrifugal Pumps

This 108-page catalog describes a diverse line of horizontal and vertical centrifugal pumps for nearly every pumping need. Bar charts show head and capacity ranges of various types of equipment. Separate engineering information section gives definitions, determinants, formulas, and engineering help. *Peerless Pump Division, F.M.C.*



398—Deep Well Submersible Pumps

Bulletin B-1000 describes Sumo's 6- and 8-in. deep well submersible water supply pumps, widely used for plants, schools, commercial buildings, and all types of services such as water supply, air conditioning, processing, and fire protection. Pump and motor are coupled together as a complete unit and operate under water. *Sumo Pumps, Inc.*



399—Centrifugal Pumps

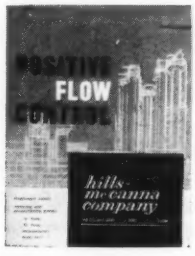
Bulletin 1100, four pages, pictures construction features of LB and LLB split case, double suction pumps. Designed for circulating hot or chilled liquids the split case provides for simple maintenance. Principal dimensions given along with selection table and performance curves at 1750 and 1150 rpm. *Weinman Pump Mfg. Co.*



400—Jacketed Rotary Pumps

Catalog Section E covers the complete line of fully jacketed rotary pumps for handling all types of viscous liquids. The heating jackets help retain the liquids that are being pumped in a flowing state. Capacities range from 9 to 450 gpm. Pumps with jacketed heads available in capacities down to 10 gpm. *Viking Pump Co.*

To order personal copies of these bulletins, please fill out the card between pages 4 and 5 or 36 and 37.



401—Positive Flow Control

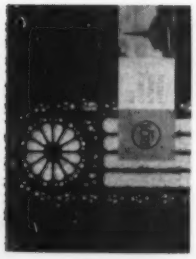
Bulletin 800 describes in detail four basic models of precision proportioning pumps for accurate and positive proportioning of flow in the range of 0 to 730 gph. Diaphragm valves, including those made of high temperature plastics, for services requiring positive closure also are covered and specifications given. *Hills-McCanna Co.*

SOUND SYSTEMS



402—School Sound Systems

Eight-page brochure 7135-D-55 illustrates and describes a complete line of Underwriters' listed school sound distribution systems. It covers equipment suitable for the smallest to the largest school units. Building-block flexibility of console styles, panels, and functions is pointed out. High power intercoms are covered. *DuKane Corp.*



403—Church Sound Systems

Recently published eight-page brochure entitled "RCA Church Sound Systems," bulletin 3R2877, illustrates and explains the need for engineering acoustically correct sound systems in churches. Basic requirements, such as good frequency range; adequate loudness; and freedom from echo, and feedback, are discussed. *Radio Corporation of America.*



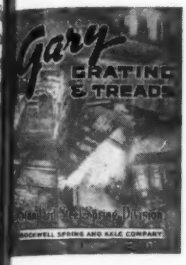
404—Hotel Sound Systems

Consulting engineers who plan sound systems for hotels and other commercial buildings will be interested in a recently published eight-page brochure entitled "RCA Hotel Sound Systems," bulletin 3R2879. It explains use of RCA equipment at the Statler Hilton, Beverly Hilton, and the Copacabana. *Radio Corporation of America.*



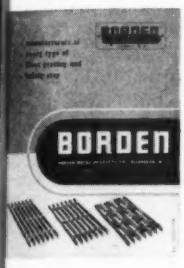
405—Industrial Sound Systems

Four-page bulletin 12k/Du illustrates and describes sound, alarm, and evacuation systems in use in some of the largest companies in the country. It outlines operation and functions of various types of systems designed to meet specific requirements, and emphasizes use of standard panels for custom systems. *DuKane Corp.*



406—Grating and Treads

Gary grating and treads tailor-made to suit your individual requirements are illustrated in a 24-page brochure. Two-page spread includes tables of safe loads, specifications, and other engineering data. Photographs also show many typical applications of the decking. *Gary Grating Div. of Rockwell Spring and Axle Co.*



407—Grating

This 16-page catalog shows the three basic types of grating construction; gives more than 30 dimensional drawings of subtypes; eight safe load tables covering steel and aluminum grating, roadway grating, and sidewalk slabs; tables on panel widths, tread widths, and floor armor. Planning layouts are given. *Borden Metal Products Co.*



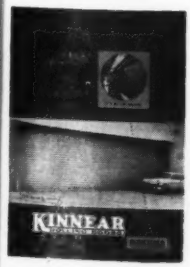
408—Rolled Steel Floor Plate

New eight-page booklet 3312 on A. W. Algrip abrasive rolled steel floor plate contains an allowable uniform load table and table of maximum sizes for plates from ⅛ to ½ inch in thickness and complete engineering and fabricating data. Many safety applications for A. W. Algrip floor plate are pointed out. *Alan Wood Steel Co.*



409—Steel Stair Treads

Tread-Grip steel stair treads combine strength of construction with safe, non-slip footing, according to four-page booklet HTP2130. It describes such features as A. W. Algrip nosing, electroforged and welded construction, and twisted cross bars. Detail drawing and tables of dimensions are included. *Horace T. Potts Co.*



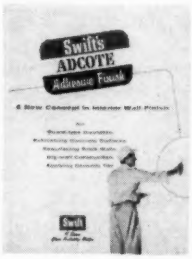
410—Industrial Doors

Bulletin 93, 24 pages, is a complete catalog of the many types of doors made by Kinnear. It gives information on the types of operation, both manual and electrical; elevation drawings; mounting methods for various applications and locations; specifications; and explains special construction features. *Kinnear Mfg. Co.*



411—Non-Shrink Mortar

Four-page bulletin E-38 discusses the need for, and difficulty in obtaining, non-shrink mortar for bonding, grouting, patching, and watertight job applications in new construction. Large illustration shows twelve important job applications and text cites the advantage of Embeco non-shrink motar. *The Master Builders Co.*



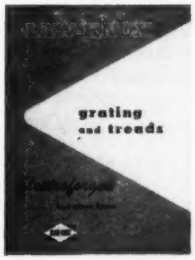
412—Interior Wall Finish

Swift's Adcote adhesive finish, a new concept in interior wall finish for board type insulation, refinishing concrete surfaces, resurfacing brick walls, dry wall construction, and applying ceramic tile is described in folder 9383. Principally for cooler and freezer walls, the finish retains its whiteness. *Swift & Co., Adhesive Products Dept.*



413—Rolling Doors

Twelve-page bulletin 92 demonstrates how both wood and steel RoL-TOP doors, with their straight-line outward appearance, are well suited to modern building needs. Drawings show recommended types for various applications and clearances, types of operation, special features, and dimensions. *Kinnear Mfg. Co.*



414—Grating and Treads

Bulletin 2527 features the entire line of grating and stair treads available from the Blaw-Knox Co. It tells how to specify grating, and gives a table of safe loads. Photographs of electroforged, rectangular interlocked, diagonal interlocked, U-Type, riveted, and T-Interlocked grating are included with specifications. *Blaw-Knox Co.*



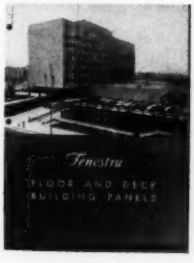
415—Asphalt Mastic Floors

This folder deals with a complete list of industrial mastic floorings: asphalt mastic, acid proof mastic, heavy duty trucking and asphalt block floors, also the new Ferrolite hot mastic floors in colors. Shows advantages and adaptability of asphalt mastic floors, especially acid proof types, with thickness and weight loads. *Fulton Asphalt Co.*



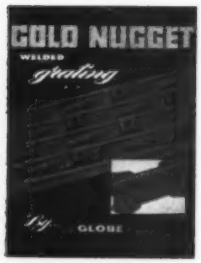
416—Aluminum Grating

This new four-page folder features unusual uses for floor grating, including its use as sun shades for modern schools, and as low maintenance pressure-locked fencing that never needs painting. It shows dimensional diagrams of standard designs and gives safe load table for aluminum grating. *Borden Metal Products Co.*



417—Floor & Deck Building Panels

BP-20 deals with light gage steel cellular structural panels. Long span panels are available up to 31 feet long for normal roof loadings. Variations such as integral acoustical and electrification systems also are shown. Descriptions, specifications, installations, engineering data, and construction details are included. *Fenestra Inc.*



418—Welded Grating

This eight-page bulletin shows details of new lightweight, extra strong Gold Nugget welded grating suitable for power houses, loading docks, oil refineries, fire escapes, drain grates, and all types of heavy duty platforms. General engineering data, safe loading tables, and directions for specifying welded grating are given. *The Globe Co.*



419—Rigid Frame Buildings

Stran-Steel's new series of industrial and commercial rigid frame structures, 50- and 60-ft bow-string truss buildings, and Stran-Satin metal wall are detailed in 18-page catalog. Colorful illustrations show these buildings in use as manufacturing plants and warehouses, for retail operations, and municipal installations. *Stran-Steel Corp.*



420—Colored Hot Mastic Floors

Bulletin deals with new type Ferrolite hot mastic floors in colors (red, brown, green, gray, and black), completely acid, oil, and grease proof. Complete information is presented on what Ferrolite is, how it is laid, special uses, where it can be used, and types of applications that are best suited to its use. *Fulton Asphalt Co.*



421—Fir Plywood Diaphragms

Now the complete information you've been wanting on Fir Plywood diaphragms is available in this easy-to-use, handy-to-file, ten-page folder. It contains such information as: the importance and function of diaphragms, their advantages, how they are designed, and cost with specifications. *Douglas Fir Plywood Assoc.*



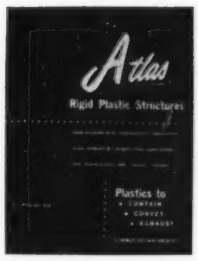
422—Architectural Products

New wide-flange shapes, 10- and 12-in. joists with 3-in. flanges, and an expanded section of loading tables are introduced in this new catalog. Also detailed are complete line of joists, studs, channels, ribbed decking, and metal curtain walls. Nailable feature permits attachment of collateral material easily. *Stran-Steel Corp.*



423—Concrete Fasteners Guide

Catalog 57 features the complete line of Red Head concrete fasteners. Contains specifications for snap-off end, rod hanger, tie-wire, stud-anchor, flush end, and clinch nail fasteners (¼- to ⅞-in. bolt size). Diagrams illustrate impact hammer and hand installation. Accessories and electric impact hammer also are shown. *Phillips Drill Co.*



424—Rigid Plastic Structures

Bulletin 9-2 deals with Atlas corrosion resistant rigid plastic structures th contain, convey, or exhaust corrosive It also shows typical installation phot and resistance characteristics for bo thermoplastic and thermo setting fabr cations such as pipe, fittings, tank fume exhaust systems, and proce equipment. *Atlas Mineral Products C*



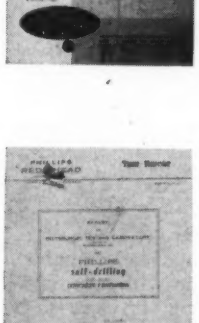
425—Grating Flooring and Treads

General grating catalog F-400 contain illustrations, descriptions, and comple engineering data on grating floorin treads, and floor armoring (rivete press-locked, and welded types). Irvin Grating is safe, durable, fireproof, ven tilating, clean, and economical for in dustrial and power plants and stair ways. *Irving Subway Grating Co., Inc*



426—Concrete Curing

Horncure concrete curing compound — 100 percent resin base curing compound, white pigmented curing compound, and wax-resin base curing compound — are described in four-page bulletin 1415. It gives advantages, use and specification and quantity required for each of three types. *A. C. Horn Co., Inc., Sun Chemical Corp.*



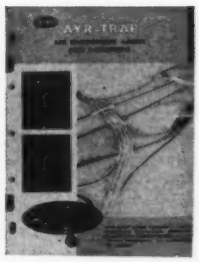
427—Concrete Fasteners

Bulletin A-1101, "Report of Pittsburgh Testing Laboratory on Phillips Self-Drilling Red Head Concrete Fasteners," includes data on pull-out load values, testing procedures, compressive strength of concrete used in tests, concrete characteristics, and a chart showing test results. Photos show specimens under test. *Phillips Drill Co.*



428—Precast Floors and Roofs

The Flexicore fire-resistant precast concrete floor and roof system is described in this eight-page bulletin. It includes details on use with structural steel, reinforced concrete, and wall-bearing construction. It gives electrical and mechanical details, load tables, design information, and complete specifications. *The Flexicore Co., Inc.*



429—Air Entraining Agent

Ayr-Trap air entraining agent for concrete is described in four-page folder D19484. It explains its function in production of mass concrete and concrete paving, for ready mixed concrete, in concrete products and blocks, concrete pipe, and other uses such as for concrete curbing, planks, and flooring. *A. C. Horn Co., Inc., Sun Chemical Corp.*

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430—Prestressing Concrete

Two of the most common methods of computing elongation are outlined. One is based upon tensioning 70 percent of ultimate strength; the other upon application of pounds per initial load. A typical load elongation curve on ⅜- and 7/16-in. strand is included as well as tables and charts on physical properties. *Union Wire Rope Corp.*



431—Douglas Fir Plywood

Full-page structural drawings that provide basic information on the types, grades, and applications of Douglas fir plywood are contained in this 34-page book. Data on floor, single and double wall construction, roof construction, and excerpts from FHA "minimum property requirements" are included for reference use. *Douglas Fir Plywood Assoc.*



432—Wall Panels

BP-21 deals with light gage steel and aluminum insulated and uninsulated wall panels with galvanized steel, porcelainized aluminum, or leatherette aluminum finish. Included are such items as Fenestra's movable 2-hour fire partition. Length of sections is up to 31 feet. Includes specifications and construction details. *Fenestra, Inc.*



433—Tunnel Rehabilitation

New 12-page *Prepakt Reporter* features comprehensive article on the rehabilitation of tunnels. Report explains how most tunnel failure is caused by normal cyclic weathering or by the movement of earth and rock through which tunnel was bored. Repair procedures on three typical railroad tunnels are outlined in detail. *Intrusion-Prepakt, Inc.*



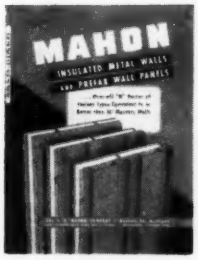
434—Cold Weather Concreting

This four-page bulletin, SI-57, explains the action of Sikacrete accelerating densifier and its beneficial effect on the structural properties of concrete. The rapid strength development afforded by Sikacrete will reduce the possibility of damage by freezing. Complete specifications and test data will be sent with folder. *Sika Chemical Corp.*



435—Walls of Steel

"Walls of Steel," 40 pages, fully discusses the selection, fabrication, and erection of steel for many recent commercial and industrial buildings. Many photos, drawings, and construction details illustrate the text. Discusses the use of steel panels as spandrels, column covers, and mullions and lists types and shapes available. *U. S. Steel Corp.*



436—Insulated Metal Walls

Insulated metal walls and wall panels of various types, and Underwriters' rated fire walls, with over-all "U" factor superior to that of a conventional masonry wall with furred lath and plaster, are described in 16-page bulletin W-58. Materials, construction, thermal properties are given, with construction details. *The R. C. Mahon Co.*



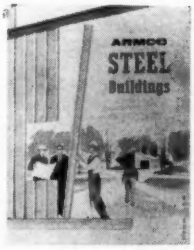
437—Prestressed Concrete Wire

This comprehensive manual deals with Tufwire stress relieved wire and strand for prestressed concrete. It features widening application of both pre-tensioning and post-tensioning, and includes engineering data on methods of determining elongation values together with typical elongation curves and tables. *Union Wire Rope Corp.*



438—Electrified Sub-Floors

Mahon electrified Cel-Beam floor systems designed to safeguard buildings against electrical obsolescence are detailed in this new 16-page bulletin M-58. Use with concrete topping and floor covering, fire resistance ratings, engineering data, dimensions and specifications, and load and property tables are given. *The R. C. Mahon Co.*



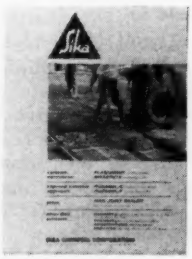
439—Steel Buildings

This bulletin contains complete information on more than 5000 Armco steel building sizes to meet every space need, catalogued under shed roof, gable roof frameless, gable roof rigid frame, gable roof truss type, and gable roof. Drawings, installation photographs, plans, and specifications are included. *Armco Drainage & Metal Products, Inc.*



440—DC Welders

Bulletin SB-1337 describes portable welding machines used in field fabrication and erection of steel in all types of structures. Provides complete specifications and operating details of interest to engineers concerned with construction equipment. Covers gasoline engine-driven welders in 200 through 600 amp sizes. *The Lincoln Electric Co.*



441—Compounds for Construction

This eight-page general catalog deals with Sika's compounds for concrete construction: concrete admixtures; exposed concrete aggregate surfaces; flexible joint sealers; quick-setting compounds, coatings, and impregnations. Complete descriptions, specifications, and typical applications are included. *Sika Chemical Corp.*



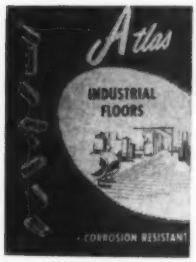
442—Tunnel Concreting

MBR-P-8, 28 pages, contains twelve reports of concrete quality control achieved during construction of major tunnel projects in the western hemisphere. Discusses the concreting problems encountered in highway, railway, and water tunnel work and describes the role of Pozzolith in achieving uniform concrete. *The Master Builders Co.*



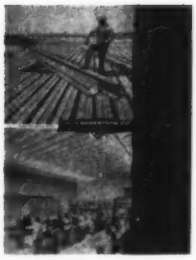
443—Roof Decks

"Pyrofill Gypsum Concrete Roof Decks," 12-page technical information bulletin, includes a general usage table, recommendations and limitations of use, acoustical and light reflecting properties, thermal insulation values, structural data, details for application over beams and bar joists, and specifications. *United States Gypsum.*



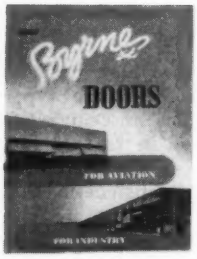
444—Industrial Floors

Bulletin 3-3 fully describes Atlas corrosion resistant industrial floor "individually engineered" for each specific problem. Methods of construction and material quantity estimating table are also included. Two types of flooring are described: Alkor furfuryl alcohol resin and Vitrobond plasticized hot pour sulfur base. *Atlas Mineral Products Co.*



445—Long Span Roof Deck

Bulletin Q-48-57 explains how you can add new scope to your roof design by use of Robertson Long Span Q-Deck, now available in three depths — 4½ and 3 inches, in addition to the original 7½ inch. Load tables are given for each, along with a table of properties, detail drawings, and photos of typical applications. *H. H. Robertson Co.*



446—Doors

Typical examples of doors built by Byrne are illustrated in 16-page bulletin "1957 Byrne Doors for Aviation and Industry." A chart shows the units that comprise each type of door, the opening movement, and dimensional limitations. Detail drawings, specifications and suggested uses also are given for each. *Byrne Doors, Inc.*



447—Safety Grating

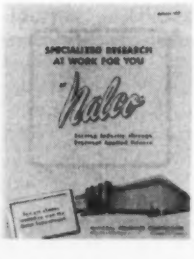
Safety Grip-Strut, an anti-skid grating in which the vertical members are joined by integral saddle to create lateral struts of great strength, is described in 12-page booklet. General applications, installation and assembly, and fastening devices are discussed. Load tables are given for both steel and aluminum grating. *The Globe Co.*

WATER TREATMENT AND WASTE DISPOSAL



448—Water Supply

"Supplying Water for Municipal and Industrial Use," 20-page catalog, explains how the Ranney Method can provide any type of water program for these users. Horizontal collectors, infiltration galleries, vertubes, and intakes are fully described. Photographs and schematics depict each operation. *Ranney Method Water Supplies, Inc.*



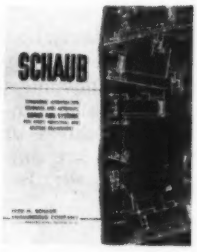
449—Research Facilities

Bulletin 100, eight pages, pictures Nalco research facilities. Brief descriptions of the areas in which the company conducts research are given with information on the type of specialized studies the Nalco staff is prepared to undertake for the consulting engineer working on industrial projects of various kinds. *National Aluminate Corp.*



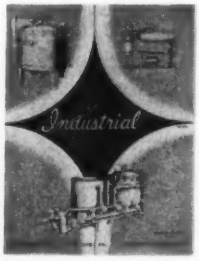
450—Self-Cleaning Fluid Filters

The Industrial Hydra-Shoc filter, incorporating a new principle in filter design that uses sudden pressure drop for extremely fast cleaning, is described in four-page folder 114-1155. Colored flow diagrams illustrate the operating sequence — precoating, filtering, and Hydra-Shoc. Filter is vertical type. *Industrial Filter & Pump Mfg. Co.*



451—Boiler Feed Systems

Catalog 55-B, 16 pages, covers condensation drainage and automatic boiler feed systems for every industrial and heating requirement — boiler return, Pre-Heat, heat reclaim and deaerating systems. General application and function of each type of system is described to help you select the right one. *Fred H. Schaub Engineering Co.*



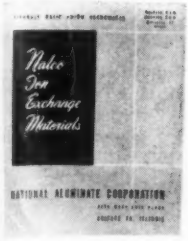
452—Water and Chemical Filters

Vertical leaf filters with a wide range of uses in chemical and water purification processes are described in eight-page bulletin 111-112-1155. Features such as "lift-out" leaves with top or bottom outlets, quick opening devices, jacketed shell for temperature control and cleaning devices are illustrated. *Industrial Filter & Pump Mfg. Co.*



453—Filmeen Treatment

Bulletin 5013 deals with Dearborn's patented Filmeen for the control of corrosion in condensate systems and increased heat transfer. The bulletin tells the cause of return line corrosion, and how Filmeen prevents it and cuts maintenance costs. Alkameen, another Dearborn product, is also discussed in the bulletin. *Dearborn Chemical Co.*



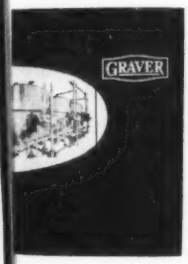
454—Cation Exchangers

Bulletin 58, 24 pages, gives physical data on Nalcite HCR cation exchanger and complete information on its use for commercial, municipal, and industrial water softening. It covers capacity ratings, hardness leakage, regeneration and operation for both cold and hot water service, and sodium and hydrogen cycles. *National Aluminate Corp.*



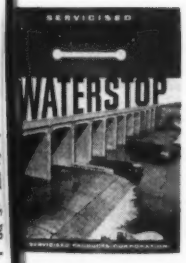
455—Hot Process Softeners

Hot process softener bulletin 4800, index 2.01, 24 pages, covers the reasons for such softeners, their advantages, and types of hot process softening for varying water conditions. Designs available include integral deaerating heaters. A section is devoted to hot lime zeolite systems and chemical reactions. *Cochrane Corp.*



456—Zeolite Water Softeners

"Zeolite Water Softeners," bulletin WC-108, describes the zeolite exchange process as used for water softening and alkalinity reduction. The sodium and hydrogen cycles are discussed with typical chemical results. Equipment is described in detail and basic sizing charts are included for specific applications. *Graver Water Conditioning Co.*



457—Plastic Waterstops

Bulletin PVW-57 contains information designed to aid in the selection and specification of polyvinyl plastic waterstop. It describes the types and sizes and physical characteristics of Servicised polyvinyl plastic waterstop. Photographs illustrate the quick, easy field splicing of this product and typical applications. *Servicised Products Corp.*



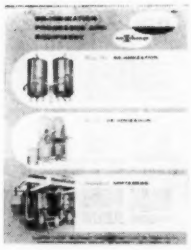
458—Vertical Water Well

The newest development in the vertical waterwell field is the subject of this new brochure. Called the Ranney-Vertube, it is a natural gravel vertical well, designed exclusively for low volume users, at low cost. A diagram of the well showing operational features completes the brochure. *Ranney Method Water Supplies, Inc.*



459—Incinerators

"Dravo Continuous Flow Incinerators," bulletin 1506, describes generally the Dravo incineration plant as a complete process, including everything from the receiving system to the discharge stack. Plants are designed for handling burnable refuse at rates from 3 to 40 tons per hour without odor and smoke. *Dravo Corp.*



460—Water Treatment

Bulletin B-157 provides interesting descriptions of all Illco-Way products, including method of operation and general purpose of each unit together with principal advantages and typical applications. Coverage includes mixed-bed and two-bed de-ionizers, softeners, filters, aerators, clarifiers, package units. *Illinois Water Treatment Co.*



461—Sewage Pump

Bulletin P10-B26 describes the Wemco torque flow sewage pump for all phases of sewage treatment operation. It discusses liquid impeller torque flow that is used in a completely open pump housing to allow passage of all materials without stoppage, and includes diagrams and sketches of operation and construction. *Western Machinery Co.*



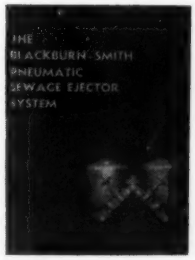
462—Engineering Manual

Bulletin 1000 is a multi-bulletin, catagorized, consulting engineers' manual covering all types of equipment necessary for specifications on water treatment. Descriptive literature, engineering drawings, and specifications are included. Forty separate bulletins, comprising over 100 pages, cover all equipment. *Dearborn Chemical Co.*



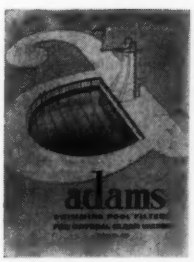
463—Flotation Unit

Bulletin WC-119 describes a basic flotation unit used for clarification, water recovery, product recovery, and pollution elimination. A detailed drawing of the unit and a description of how it operates are included in addition to some of the possible applications for this exclusive Aeroflotor design. *Graver Water Conditioning Co.*



464—Sewage Ejectors

The Blackburn-Smith pneumatic sewage ejector system utilized for elevation of sewage from low points to main higher sewer lines is described in bulletin S-55. Available are single and twin units, in cast iron or welded steel, sizes 30 to 500 gpm, heads to 150 feet. *Blackburn-Smith Mfg.Co., Div. of Condenser Service & Engineering Co., Inc.*



465—Swimming Pool Filters

Bulletin 625, 24 pages, discusses filtration for modern swimming pools of 50,000 gal capacity and over. It has sections on design features of purification and filtering systems, operation phases of filtration cycle, choosing the right filter, installation drawings, dimension charts, and table of filter sizes. *R. P. Adams Co., Inc.*

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